The Journal of Army Space Operations

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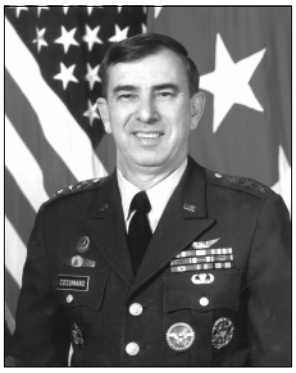

LTG Joseph M. Cosumano, Jr.

Lieutenant General Joseph M. Cosumano, Jr., is the Commanding General of the U.S. Army Space and Missile Defense Command and the Army Space Command.

Normalizing the Army's Use of Space with Seamless Integration

by LTG Joseph M. Cosumano, Jr.

Every day, our world is becoming more dependent on Space.

In announcing his Space initiatives recently, Secretary of Defense Donald H. Rumsfeld described this new world: "Satellites . . . collect information on capabilities and intentions of potential adversaries; monitor treaties and agreements; and support military operations worldwide. U.S. Space capabilities enable military forces to be warned of missile attack, to communicate, navigate to an area while avoiding hostile action, and precisely attack targets in ways that minimize collateral damage and protect the lives of U.S. soldiers, sailors, Marines, and airmen.

"Our dependence on operations in Space, however, makes us somewhat vulnerable to new challenges. It's only logical to conclude that we must be attentive to these vulnerabilities and pay careful attention to protecting and promoting our interest in Space . . . ."

In recognition of this reality, last year Congress directed the creation of the Commission to Assess United States National Security Space Management and Organization to take a comprehensive look at the future impact of Space on the U.S. military. As a result of this study, the Commission recommended changes to ensure the status of the United States as the world's leading Space-faring nation.

Here are some of its more important conclusions.

- U.S. national security Space interests should be recognized as a top national security priority needing presidential leadership to ensure the cooperation needed from all Space sectors—commercial, civil, defense, and intelligence.
- Government agencies are not organized to meet the national security Space needs of the 21st century.
- It is certain that Space will see conflict and the United States must develop the means to both deter and defend against hostile acts in and from Space.
- Finally, the United States must invest in science and technology resources, facilities, and people to remain the world's leading Space-faring nation.

In response to the Commission's recommendations, Secretary of Defense Rumsfeld recently announced a transformation of the management and organization of Space programs. As part of that reorganization, the Air Force will: 1) create a new four-star position for the commander of Air Force Space Command, separate from CINCSPACE and CINC NORAD, and assign new responsibilities to this command; 2) realign to more effectively organize, train, and equip Space forces; 3) become the DoD Executive Agent for Space, responsible for planning, programming, and acquisition; 4) enhance Space professional military education; 5) integrate Space activities into military operations; and 6) have the Under Secretary of the Air Force assume additional duties, including becoming the director of the National Reconnaissance Office, the Acquisition Executive for Space, the milestone decision authority for defense Space programs, and oversight authority of the National Security Space Architect.

Related to these changes, the Army and Navy will: 1) enhance Space professional military education; 2) maintain a cadre of Space-qualified officers; 3) integrate Space activities into military operations; 4) establish Space requirements; and 5) research, develop, acquire,

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Mission: The *JASO* is published quarterly by the U.S. Army Space and Missile Defense Command. The journal provides a forum through which Space Operations officers can disseminate professional knowledge and furnish information concerning their activities within the U.S. Army. The purpose is to increase the effectiveness of Space operators through a professional discussion of events and lessons learned.

Commanding General:
LTG Joseph M. Cosumano, Jr.

Deputy Commanding General:
BG Richard V. Geraci

Director, FDIC:
COL Glen Collins, Jr.

Proponency, Organization, & Training Support Division Chief:
Patsy Campbell

Chief, Public Affairs:
William Congo

Managing Editor:
Jonathan Pierce

Comments: Inquiries should be made to the Director, Force Development and Integration Center (FDIC), ATTN: SMDC-IC, P.O. Box 15280, Arlington, VA., 22215-0280.

Telephone: (703) 602-1417, DSN (332)

Fax: (703) 607-2035

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Unsolicited manuscripts are welcome. They should be sent to the attention of LTC Larry Fallen at the FDIC address listed above.

The Journal of Army Space Operations

A Professional Journal for Army Space Operators

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and deploy Space systems unique to their Services.

All of us who recognize the need to better leverage and protect Space assets should welcome these changes because they are needed to ensure that Space will provide the navigation, warning, intelligence, and communications essential to the future Objective Force.

As it is, the Army is already dependent on Space for communications; position; navigation and timing; weather, terrain, and environmental monitoring; missile warning; and intelligence, surveillance, and reconnaissance.

Our next step should be to normalize Space for warfighters.

While we've made great progress in these areas, our next step should be to normalize Space for warfighters. So doing will enable them to see first, understand first, and act first—essential attributes of a lighter, more agile force.

For example, Space capabilities will be a critical aspect of the Objective Force's ability to see the battlefield, especially at night and in adverse weather. Space-based capabilities will also be necessary in compartmented and urban terrain, and satellite communications will give us the ability to reach back to CONUS support and tie together a force operating over hundreds of kilometers.

Ultimately, the goal is for Space to provide a single integrated air picture (SIAP) for Joint forces and our allies. This common picture will be especially critical to the success of the layered missile defenses likely to be fielded to meet evolving ballistic- and cruise-missile threats. SIAP will enable each "layer" to detect missile launches and track ballistic and cruise-missile threats as they pass through their boost, mid-course, and terminal phases of flight. Having this capability will allow commanders to more effectively and economically use available missile defense systems.

When you add in Space-based weather forecasting and terrain analysis, it is clear that Space will be a critical enabler of the Objective Force.

But while all this capability is impressive, let's not lose sight of our ultimate "customer," the warfighter. In our effort to bring all this information to the battlefield, we must make it transparent and timely, or it will be of no use in the heat of battle. We must also ensure that these massive streams of data are converted from simple information into useful knowledge in the "foxhole."

At the higher organizational level, we must ensure that Space is seamlessly integrated into all land operations, and that it provides responsive and reliable support to commanders at all levels.

Only when all these goals are realized will Space be normalized.

Here's what we're doing to get there.

- We are establishing a separate Space division on the Army staff to better coordinate Army Space activities.
- We are active participants in a number of working groups established by the Air Force to recommend ways to implement the Secretary of Defense's decisions on Space.
- We have initiated a Department of the Army level Space Force Management Analysis Review (FORMAL) to look at the Army's Space mission in light of our capabilities and force structure. FORMAL results will be provided to the Vice Chief of Staff of the Army.
- We are improving the training and expanding our cadre of Functional Area 40 (FA 40) Space Operations officers.
- We are expanding our Army Space Order of Battle. We have already established the 1st Space Battalion at Army Space Command and are in the process of standing up the 193rd Space Support Battalion from Colorado Army National Guard assets. Additionally, we are in the process of forming a Space and Electronic Warfare Detachment.

In closing, I want to say that after only a short time here, I've seen enough to be confident that SMDC has the people, facilities, organization, values, and vision to ensure that Space is normalized in the Objective Force.

Thanks for all your help and keep up the good work.

Secure the High Ground!

BG Richard V. Geraci

Brigadier General Richard V. Geraci is the deputy commanding general for Operations and Army Space Command, U.S. Army Space and Missile Defense Command. Previously, he was the deputy director, J-9, Joint Warfighting Experimentation, United States Joint Forces Command, Norfolk, Va. He has had numerous Army Air and Missile Defense assignments in Europe and has commanded PATRIOT units in V Corps, III Corps, and in Saudi Arabia. His office is located in Colorado Springs, Colo.

Why the Army Has Space Operations Officers

by BG Richard V. Geraci

The military cannot undertake any major operation, anywhere in the world, without relying on systems in Space.

– The U.S. Commission on National Security/21st Century, 15 Feb 2001

Simply put, the Army needs a cadre of officers specifically trained and knowledgeable about Space capabilities in order to focus on and address Space-related matters pertaining to warfighting. To satisfy this requirement, the Army established FA 40, Space Operations. As the Army identifies requirements and develops capabilities for the "Space-empowered" Objective Force, these Army Space Operations officers are being aggressively integrated into current operations, future planning, research and development, and acquisition positions at all organizational levels within the Army and the Department of Defense (DoD). This is a concerted effort to "normalize" Space throughout all Army operations and activities, i.e., make the use of Space, like that of communications and transportation, "business as usual."

Our Nation's success across the full spectrum of military operations in the 21st century requires officers and leaders who understand the application of Space-based capabilities to warfare. Senior military leaders must understand what Space Operations officers do and why they are critical to Army and Joint operations. Space Operations officers are trained to educate those leaders and their staffs on all aspects of Space operations.

The Army is the world's largest user of Space-based capabilities for military purposes: Consider the half million Global Positioning System (GPS) receivers on Army systems. The Army also uses Space for many other force enhancement capabilities, such as long-haul communications and command and control systems; terrestrial and Space weather information; environmental monitoring; positioning, navigation, and timing; intelligence; reconnaissance and Space and terrestrial surveillance; critical high-resolution imagery; missile early warning; and advanced targeting capabilities.

Clearly, today's Army operations are significantly enhanced by and often are critically dependent on the use of satellites. Although some officers in other functional areas and basic branches have Space-related knowledge in specialized areas, only Army Space Operations officers have the focused technical Space training and the broad Space planning skills to provide comprehensive support to the warfighter.

Tomorrow's Objective Force commander requires battlespace knowledge and understanding to maximize the full combat power of the force. This drives the requirement for information "reach back" and "push forward" (i.e., tailored broadcast capabilities for deploying and employed forces). As we continue to experiment, we have made progress in leveraging Space to meet commanders' requirements; for example, enroute mission planning for units traveling to deployment locations by providing the means to exchange critical information via satellite in near real time, improved C^2 to operate in compartmented and urban terrain, and timely access to commercial imagery for a clearer battlefield picture. Only if we understand, experiment with, and use Space can we identify and meet Objective Force needs.

On the other hand, the Army's increased dependence on Space has made our forces vulnerable. This has increased the importance of Space control, which includes preventing others from denying us the use of Space and preventing them from using Space-based capabilities against us.

Space control is critical during all phases of military operations and must be integrated into campaign planning, operations orders, and mission execution. For the Army's Objective Force, control of Space will be essential if the Army is to deny our adversaries the ability to see, target, and harm us. The protection afforded our forces by information dominance coming from control of Space assets will enhance the protection of our lighter, more deployable future combat systems. Space control is yet another venue within which the Space Operations officer brings invaluable expertise to a commander.

Space Operations officers provide products and services from military and national means to support the National Command Authority, national agencies, U.S. Space Command, all other unified commands, and the operational, warfighting, elements of all the services. They represent the Army in organizations related to Space, such as the National Reconnaissance Office, the National Security

Space Architect, and the Assistant Secretary of Defense for C^3I. Within these organizations, Army Space Operations officers are Space advocates and staff experts for their supported commanders. They are equipped with a broad understanding and knowledge of Space-based capabilities, limitations, and vulnerabilities.

Space Operations officers facilitate the integration of Army Space Support Teams (ARSSTs) and the Joint Tactical Ground Station (JTAGS) units into daily operations. The ARSSTs provide on-call, Space-based products, services, and expertise, worldwide, in support of civil and military operations. The JTAGS provides theater commanders with direct early warning of incoming missile attacks to friendly forces by working with national reconnaissance organizations. Both units provide critical information to the commander and support integrated missile defense operations.

Space Operations officers specialize in integrating Space operations into the military decision making process (MDMP). They synchronize, optimize, and deconflict the use of Space-based resources with the commander's staff and across the battlefield operating systems. They provide commanders the Space Intelligence Preparation of the Battlefield (IPB), the Space Intelligence Estimate of the Situation, and highly technical tools to support operational planning. They prepare the Space annex for the operations orders. They answer questions from the commander, J3/G3s, and other staff officers, such as: "What Space capabilities are available to our adversaries and how does that threaten the successful accomplishment of our mission? Will the enemy be able to target us? How can we deny or negate the enemy's Space capabilities? What Space assets—both U.S. and allied military and commercial—are available to the commander? How can we use those capabilities to dominate the enemy? What are our vulnerabilities and how dependent are we on Space?"

Answers to these questions improve MDMP by providing the commander and his staff information to conduct IPB and to develop courses of action within the integrated battlespace (land, air, space, and sea) where we will fight our future wars. The Space officer's input to courses of action and to decision support templates helps present a clearer battlespace understanding to the commander.

Army Space Operations officers work to complement the actions and responsibilities of the signal, intelligence, information operations, and engineering staff officers. They are trained to understand, enable, and improve on how each uses Space and to know the Space-based products they require and/or produce. They also understand the capabilities and needs of our sister services, DoD, and other Government agencies, and how they use Space. Their presence on the commander's staff complements and focuses Space-related activities across all the battlefield operating systems as well as the battlefield functional areas that the Army is addressing in its Objective Force. This Space expertise, coupled with operational and tactical expertise, clearly marks them as important members of the commander's staff.

Space-based capabilities support the Army across the full spectrum of military operations, from humanitarian operations through high-intensity conflict. For example, in a train-up for a disaster relief mission, the ARSST, which is led by a Space Operations officer and which specializes in the exploitation of commercial satellite imagery, worked with I Corps to release maps and satellite imagery to coalition forces that normally do not have access to national imagery. In the summer of 2000, they provided this same service to the U.S. Forest Service as it was fighting fires in the western United States.

To help protect American peacekeepers in Kosovo, in response to a request from Joint Task Force (JTF) Hawk's commander, Army Space Forces deployed Space support teams to provide him with Space expertise and Space-based products. The team created "3-D fly through" training aids for the JTF aviation unit, developed a Space battle update briefing, and provided the daily satellite update for all the mission areas.

Since DESERT STORM the Army has used our Space assets in high-intensity conflict scenarios during exercises and wargames. During one such exercise, a Space Operations officer identified the impact of a solar event on SIGINT collection. Prior to deployment, he coordinated with the Air Force's 55th Space Weather Squadron for daily Space weather support. The squadron also provided information on the Very High Frequency (VHF) and High Frequency (HF) propagation windows: the maximum and minimum usable frequencies for VHF and HF during the forecasted atmospheric conditions. Understanding the enemy's vulnerabilities and knowing when a significant solar event would likely severely degrade HF communications allowed the Space officer to recommend a course of action to enhance the G2 SIGINT collection.

Army Space Operations officers provide the

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COL Glen Collins

Colonel Glen Collins is the director of the Force Development and Integration Center.

FDIC Director Welcomes FA 40s as Readers, Contributors

by COL Glen Collins

This is the first edition of a professional journal for the Army's Space operators. It supports this new Army career for officers as well as the entire military Space community. We at the Army Space and Missile Defense Command (SMDC), as the Army's proponent for Space and for Space Operations officers, are honored to provide this publication.

This publication provides material on a wide range of topics. Messages from two of the senior officers of SMDC, LTG Joseph M. Cosumano, Jr. and BG Richard V. Geraci, present a challenge and expand an awareness of Army Space to members of the Space community. There are articles about the Army's role in the Space community such as "Providing an Army Perspective to the NSSA" and "Army Astronauts Energize the NASA Mission." To enhance an officer's knowledge of how Space enables the warfighter, there will be articles like, "What is Space Intelligence Preparation of the Battlefield (IPB)?" A regular column by LTC Tom Gray will present information about the Army's Transformation strategy and how Space Operations will be prominent in that plan. Information significant for the Space Operations officer's career can be found in articles like "Space Badge" and in regular columns provided by the assignment officer and the functional area management office. Personal enrichment can be gained from historical articles like "When the Sky Became the High Ground" and in book reviews like that of Steven Lambakis' *On the Edge of the Earth: The Future of American Space Power.*

It is my hope, as the director of SMDC's Force Development and Integration Center and as a fellow Space Operations officer, that this publication will not only expand your understanding of Army Space Operations and enhance your knowledge as a Space Operations officer, but will also give you a forum for discussion. This publication is for you. You are encouraged to submit articles for future publication and write us with your questions and comments to: e-mail FA40-SPACE@smdc.army.mil or post USAMDC/FDIC, ATTN: FA40, P.O. Box 15280, Arlington, Va. 22215-0280.

Space Operations Officers –

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link from the field to the combat developers. They contribute to the development of doctrine and tactics, techniques, and procedures. They ensure that operational, planning, and training documents that address Space adequately and accurately support the warfighters. Because the Army must drive service-unique Space requirements, Space Operations officers assist in identifying Army Space requirements across all components, branches, and battlefield operating systems. They focus on turning the latest Space technology into unrivaled capabilities for commanders and soldiers in the field.

While the goal of the Army leadership is to "normalize" Space across the Army, with all officers having a basic understanding of Space and military operations, the nearly 120 Space Operations officers are the only officers solely dedicated to Space Operations. No other officer will have the in-depth expertise and experience to adequately leverage Space assets for the Army. Furthermore, Space Operations officers can contribute in the evolution of domestic and international Space policy. That policy can be translated into effective Joint and Army doctrine and concepts of operation for defensive and offensive actions to support our regional commanders-in-chief.

Since DESERT STORM, the Army and DoD have made significant progress in understanding Space and warfare. Army Space Operations officers understand how to maximize the use of Space-based assets and identify new requirements to enhance our Army's warfighting capabilities. These officers are trained and prepared to be an integral part of the Army's Objective Force. They form a Space-smart cadre in a position to exploit the use of Space for the Army today and in the future. The addition of Space Operations officers has better prepared the Army to deal with Space and its effect on 21st century warfare.

Space is the highest hill around, but since it does not have dirt on it, too many in the Army are not prepared to deal with it.

– Edward Kiker
Army Space Institute, 1992

The Functional Area Management Office—"Here to Serve"

by LTC Larry Fallen, Division Chief

"There is a clear linkage between the exploitation of Space and the warfighter's ability to achieve success on the battlefield. To meet the challenges of the future, the Army's requirements for Space capabilities will increase significantly. The move toward an agile, versatile force that is more strategically responsive will be highly dependent upon assured access to adequate orbital and ground-based Space assets and seamless integration with complementary capabilities."

– United States Army
Space Master Plan

Space is the high ground today and will be in the future. Space systems are critical enablers to achieving information dominance and ensuring full-spectrum dominance across all levels of conflict. The Army will not be able to execute its future concepts and doctrine without Space capabilities.

The Space Operations officer, FA 40, was created to assist commanders in simplifying the use of Space assets and products. The FA 40 provides a full spectrum of expertise in Space Operations to ensure the best use and full integration of Space capabilities into the organizational planning and operations cycle.

Strategically, the military's reliance on Space and its concern that Space may be used effectively by adversaries has led to a growing awareness of the importance of controlling Space and the desire to acquire systems and capabilities that can guarantee that control. The role of the Space Operations officer has now become critical.

The Functional Area Management Office supports Space Operations officers. As the emissary of the Army's Space and Missile Defense Command, proponent for FA 40, Space Operations officers, members of this office are a frontline contact for the officer. We make every effort to stay in close contact with every officer. To do this, officers must keep us informed of current contact information, especially e-mail addresses. This office is here to answer questions and respond to the needs of all FA 40 officers. A special hotline has been established to provide instant contact: e-mail FA40-SPACE@smdc.army.mil or telephone 703-602-1325 (DSN 332 1325).

Actions taken by this office include ongoing reviews of the force structure to expand the presence of Space Operations across the Army. To educate the commander of the value added of a Space Operations officer, a compact disc has been developed. The CD has an introductory briefing about the role of the Space Operations officer, resource information about the duties of a Space Operations officer, training provided for the Space Operations officer, and regulatory guidance about the functional area.

This office is responsible for officer development and has oversight of the Space Operations Qualification Course, Advanced Civil Schooling and Training With Industry. To keep Space Operations officers current, we host an annual training conference, the electronic messages mentioned above, an FA 40 website, and this publication.

In July 2001, there were 118 officers in the ranks of Space Operations. Additional officers are expected when YG 91 is announced—probably prior to distribution of this publication. The following officers have been career field designated as Space Operations officers. Additional officers, at the rank of captain, have selected FA 40 as their functional area.

YGs 75-79

COL Patricia A. Baxter
COL Boyce K. Buckner
COL Donald A. Coe
COL Glen C. Collins
COL David G. Farrisse
COL Jeffrey Horne
COL David F. Ifflander
COL John V. Klemencic
COL William Partridge
COL John S. Prall
COL David W. Shaffer
COL Jon P. Smart
COL Kurt S. Story
COL Frank P. Todd
LTC Robert M. Bankey
LTC Doug Barton
LTC Robert Boggs
LTC Mark T. Dunaiski
LTC Patrick Forrester
LTC Ricahrd G. Gollan
LTC Nathan C. Harnagel
LTC John L. Houston
LTC James E. Lawson
LTC Gary L. Moore
LTC James Pierson
LTC Stephen H. Savage
LTC Robert G. Simmons

YG 80

LTC Michael C. Connolly
LTC Randall Cox
LTC Nancy Currie
LTC Larry D. Fallen
LTC Thomas A. Gray
LTC Terry W. Potter
LTC Edward M. Sekerak
LTC Craig M. Whitehill
LTC Jeffrey Williams

YG 81

LTC William Anderson
LTC Wayne Michael Brainerd
LTC John Britten
LTC Robert Bruce

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LTC Larry Fallen

Lieutenant Colonel Larry Fallen is the head of the Proponency and Training Division of the SMDC Force Development and Integration Center.

Developing a Cadre of Space-Smart Soldiers

by LTC Larry Fallen

Space capabilities are key enablers for achieving the Army Vision 2010 and the Transformation objective of fielding a force that is strategically responsive and dominant at every point on the operational spectrum. Space capabilities provide critical force enhancements for land force operations and are essential to achieving the Objective Force characteristics articulated in the Army's Transformation Vision. This vision cannot be achieved without them. As the Army transforms, Space assets will not only support the Objective Force but must also continue to support both the interim and legacy forces.

With the implementation of the Officer Professional Military System XXI (OPMS XXI), the Army is well on its way to identifying requirements to meet the challenges of the 21st century. The OPMS XXI initiative created four distinct career paths for field grade officers: Operations, Information Operations, Institutional Support, and Operational Support. The Information Operations career field is designed to respond to the requirements of the 21st century information age and has the proponency for seven functional areas, one of which is the new FA 40 Space Operations.

FA 40 assists Army commanders in simplifying the use of Space assets and products. The FA 40 provides a full spectrum of expertise in Space Operations to ensure the best use and full integration of Space capabilities into the organizational planning and operations cycle. Strategically, the U.S. military's reliance on Space and its concern that Space may be used effectively by adversaries have led to a growing awareness of the importance of controlling Space and the desire to acquire systems and capabilities that can guarantee that control. The role of the FA 40 Space Operations officer has now become critical.

Current Initiatives

Training for the Space Operations officer began with the development and implementation of the Space Operations Officer Qualification Course (SOOQC). The SOOQC is a seven-week, intensive, academic program of instruction designed to create a cadre of Space-smart Army soldiers. The initial training course had 14 students and was conducted June 1–Aug. 3, 2001.

The SOOQC functions in three phases. During the first phase, students in a classroom environment receive 25 days of lecture/conference on the 24 critical tasks. The next phase is a five-day field trip to the National Security Agency, the National Reconnaissance Office, the National Imagery and Mapping Agency, the Army Space Program Office, and a trip to Ft. Bragg for a demonstration on Tactical Exploitation of National Capabilities (TENCAP) equipment. The third phase culminates with an end-of-course, four-day capstone command post exercise in which students are required to apply skills successfully from all previous instruction during a tactical scenario.

This course is designed to develop Space Operations officers who can provide commanders with a specialized capability for planning, developing, training, and integrating Space capabilities to support tactical, operational, and strategic military operations. They are also trained to provide commanders expertise and guidance on conducting the Space component of information operations. Space Operations officers are critical to empowering tactical commanders with the maximum advantages provided by Space assets. They provide a knowledgeable officer corps that provides Space expertise to tactical, operational, and strategic staffs and articulates Army Space requirements and capabilities in joint and national forums. Space Operations officers are critical to the warfighter's success; the Army cannot succeed without them.

The Next Step

The proper training and educating of the FA 40 Space Operations officers is just one step in developing a cadre of Space-smart soldiers. Additionally, knowledge of Space capabilities and their limitations must be fully embedded within all Army institutions. Throughout the entire professional military education system—from officer pre-commissioning through the general officer CAPSTONE course, from enlisted basic training through the Sergeants Major Academy, and at all DA civilian levels—Space education, literacy, and training must be a "vein" of knowledge in Army curricula.

Space literacy—the understanding of Space capabilities and products and their uses in military operations—can best be advanced through a continuum of formal education, training, and field exercises. Tactical training, starting at entry level for both officers and enlisted soldiers, is the foundation of Space literacy. As individuals are trained to do their tasks, effective applications of Space resources will become a normal part of doing business. Providing soldiers with comprehensive Space-oriented training is critical if the Army is to realize fully its potential in Space. The goal of such training is to develop soldiers of all ranks who understand the application of Space-based capabilities and who can maximize the operational potential of Space assets. Space training initiatives focus on the integration of 1) Space-related instruction and activities into all aspects of the Army's educational systems, ranging from TRADOC branch schools to unit and individual training programs; and 2) Space-related systems, products, and activities into Army training exercises, including war games, models, and simulations.

Standardized, common core instruction on how to integrate Space capabilities into operational planning should be included in all branch basic/advanced career course programs of instruction. This instruction should include descriptions of Space mission areas and how Space capabilities support Army and joint operations. Standardized Space capabilities instruction should also be incorporated into the common core Intermediate Level Education Course and the Noncommissioned Officer Educational System (NCOES). This will ensure a degree of standardized knowledge throughout the officer and NCO corps concerning the capabilities and use of Space systems and products. All leaders will share a fundamental understanding of the practical functions of Space systems at the tactical and operational levels. Leaders in all specialties—combat arms, combat support, or combat service support—will understand the role of Space at the tactical, operational, and strategic levels.

Soldiers and non-commissioned officers increasingly require a basic understanding of the effects of Space systems in the performance of their missions. At present, there is no military occupational skill (MOS) dedicated to Space. Soldiers who work with Space systems or who are assigned to Space-related positions do so in the context of their individual MOS. For example, signal soldiers and military intelligence soldiers operating within their MOSs work increasingly within the context of Space and with Space products. Air defense artillery and field artillery soldiers will become increasingly reliant on Space-based systems. These soldiers in particular (and all soldiers in general) will need to be familiar with Space systems and products and their connectivity to their specific MOS. Space-related training should be integrated into advanced, individual training to ensure that soldiers are provided the Space-related skills necessary to work within their respective MOSs.

Space education, literacy, and training must be a "vein" of knowledge in Army curricula.

Developing a cadre of Space-smart soldiers armed with the appropriate education and training will pay enormous dividends as the Army transforms into a strategically responsive force that is dominant across the full spectrum of operations. The Army must have a well-trained and innovative cadre of Space-literate personnel who understand warfighting requirements and the benefits that Space forces can bring to the Army.

MAJ Bryan Boyce

When the Sky Became the High Ground—The Army Seized It: The Development of Aerial Reconnaissance

by MAJ Bryan Boyce

"Nothing tends so much to the advancement of knowledge as the application of a new instrument. The native intellectual powers of men in different times are not so much the causes of the different success of their labours, as the peculiar nature of the means and artificial resources in their possession."

– Sir Humphrey Davy

"If I have seen further than others, it is by standing upon the shoulders of giants."

– Sir Isaac Newton

Reconnaissance has always been a critical element in the conduct of war. Successful battles and wars came on the heels of accurate information about the enemy. The modern era SALUTE (Size, Activity, Location, Unit, Time, and Equipment) report grew out of the continued requirement for accurate and timely information regarding enemy forces. States without extensive national and military intelligence gathering communities are at an extreme disadvantage in the modern world.

Reconnaissance missions have changed as the art of war has developed through the centuries. In ancient times, people (literally) on the ground were the only source of information. Eyes on the target—either those of spies infiltrating the enemy camp, observers from concealed positions nearby, or observers on high ground overlooking the target—were the only means of gathering intelligence. Even then, accurate and timely observations were not guaranteed.

The development of aerial reconnaissance was a quantum leap forward for intelligence gathering. Prior to the introduction of the first Army airplane in 1908, "captive" (tethered) and "free" balloons had already institutionalized the element of aerial observation as the leading edge of reconnaissance. This development progressed in five stages: 1) reconnaissance became an established part of warfare, 2) the inventors of balloons immediately recognized their potential for warfare, 3) aerial reconnaissance enjoyed early military successes in Europe, 4) balloons were used successfully in the Civil War, and 5) balloons continued to contribute to aerial reconnaissance in warfare.

Early Reconnaissance

Reconnaissance began as a simple and straightforward task: observe the enemy and report. Moses demonstrated this philosophy when he sent a reconnaissance party into the Promised Land of Canaan upon his arrival from Egypt in 1500 B.C. Years later, Joshua sent spies into the cities of Jericho and Ai and demonstrated the correlation between accurate and timely observations and success in battle. Furthermore, Alexander the Great spent the day before the battle of Arbela (331 B.C.) reconnoitering the position of Darius's Persians.[1]

By the time of the Roman Empire, reconnaissance had become an integral part of strategy and tactics. Through the Middle Ages, reconnaissance grew from an ad hoc assemblage of volunteers to organized units of mounted cavalry. As the mounted cavalry units grew in size and experience, their value as a fighting force inserted during critical points of the battle contributed to the reduction of their reconnaissance role. Finding the right balance was a challenge for the battle captains of the day. Frederick the Great set a great value on the cavalry, which constituted a fourth of his army, but he used it only for shock action in solid tactical units. His scouting service was therefore poor; in 1744, with 20,000 cavalry, he could not find the Austrians.[2]

Over time, however, the combination of cavalry that could fight and reconnoiter—the advance guard—added a new chapter to strategy and tactics. Clausewitz commented in *On War*:

> Advance guards and outposts belong to the category of measures where the threads of strategy and tactics are interwoven . . . . Any force . . . needs an advance guard to detect and reconnoiter the enemy's approach before he comes into view. After all, a troop's range of vision does not usu-

> ally extend beyond the range of fire. How unfortunate it would be if our eyes could see no further than our arms could reach! *It has been said that outposts are the eyes of the army* [emphasis added].[3]

Observation depends on line of sight; the farther you can see, the more you can observe. It was obvious to early battle captains that the higher the observation post, the better the view. The better the view, the better the observation reports on the enemy. Hence, early strategy required the occupation of high ground for observation posts. When natural terrain did not provide high ground, strategists and tacticians were forced to improvise. Alfred Burne credits Edward III's windmill at Crecy as such an observation post: "though not centrally situated [it] allowed an uninterrupted view of the whole position and of the French advance."[4]

Ballooning's Beginnings

The story of the first balloons begins in France in the winter of 1782 as a dramatic competition between two sets of brothers with different ideas on how to create a balloon that could carry a man into the sky. Joseph and Etienne Montgolfier were paper manufacturers who discovered that large paper sacks filled with heated air would rise. The Robert brothers, along with Dr. Jacques Charles, also discovered that a balloon filled with hydrogen was lighter than air. The hydrogen-filled *charliere* balloon, although unmanned, flew first on Aug. 27, 1783, in a flight that lasted 45 minutes and covered 15 miles.[5] The *Montgolfiere* balloon flew four weeks later, on Sept. 19, carrying a sheep, a rooster, and a duck in a flight that lasted eight minutes and covered six miles.[6]

Monsieur Francois de Rozier was the first man to ascend in a balloon although ropes tethered his Oct. 15 flight. De Rozier's first real balloon ride came in a *Montgofliere* balloon on Nov. 21, 1783, when he covered some 25 miles before descending.[7] The affidavit certifying his flight bears the name of an important American who was in Paris at the time: Benjamin Franklin. Ballooning was an instant hit with the public, and within 14 months Jean-Pierre Blanchard crossed the Channel from England to France.[8]

Balloons in Wars Before 1861

The first company of the French Aerostatic Corps was formed on April 2, 1794, under the command of Dr. Jean-Marie-Joseph Coutelle, who had developed the iron contact process of making hydrogen.[9] The company, with its captive *charliere* balloon *Entreprenant*, was ordered to duty with General Jourdan's army against the Austrians that same month. It was successfully used as an aerial observation post in the battle of Fleurus on June 26 and again in the battle of Sombreffe on July 5. Tissandier wrote in *Histoire des Ballons et des Aeronauts Celebres* that Coutelle explained the usefulness of the balloon at the battle of Fleurus in this way:

> I shan't [sic] say that the balloon won the battle of Fleurus . . . . What I can say is that, being trained to use my glasses in spite of the oscillation and swaying due to the wind, I was able to distinguish infantry, cavalry, artillery, their movement, and, in general, their numbers.[10]

Although balloons were used throughout the war and several even accompanied Napoleon to Egypt in 1798, the French Aerostatic Corps was allowed to disintegrate soon after due to lack of funds.[11] The British military appeared uninterested in the whole venture. John Money produced his *Treatise on the Use of Balloons and Field Observators in Military Operations* in 1803, but the Secretary of War was unconvinced. Henry Coxwell tried to persuade the War Office to use balloons in the Crimea, but he too was unsuccessful.[12] The next successful use of balloons as aerial observation posts would take place during the American Civil War.

Balloons in the Civil War

The story of aerial observation balloons in the Civil War is a remarkable one, especially since it is virtually unknown. Except for the efforts of COL Charles de Forrest Chandler, U.S. Army (Ret), who in 1936 recorded his own experiences and those of the aerial scouts who had served in the Aviation Section of the Signal Corps before him, most of this information would be lost. Chandler cited these reasons for his interest in using balloons during the Civil War:

> First, for the energy, resourcefulness and efficiency displayed by the civilian aeronauts who organized the service, provided the material, operated the balloons, and made most of the observations; second, for the keen interest manifested by numerous division and higher commanders, many of whom made their own observa-

> tions from the balloons in the air; third, for the excellent results obtained from balloon observations as attested in official reports; and finally, for the discontinuance of operations in 1863 in spite of two years of valuable service rendered to the Union armies.[13]

The story of aerial observation balloons in the Civil War and the name Thaddeus S. C. Lowe are rarely spoken separately. Prior to the war, Professor Lowe constructed a huge silk balloon with a gross lift of 20 tons, which he intended to use for a free flight across the Atlantic. Unfortunately, his test flight occurred just days after the war began, and upon his release after capture in South Carolina, he decided his expertise should be channeled into the war effort.[14] His demonstration in Washington on June 6 of an aerial observation post onboard his balloon *Enterprise*, connected by telegraph to the White House and the War Department, sealed his appointment as head of the Balloon Service.[15]

Professor Lowe wasn't the first aeronaut to offer his services to the Union Army, however. This distinction belongs to James Allen. Just one week after the first shots were fired at Fort Sumter in April 1861, Allen was off to Washington with his two balloons. Although Allen's balloons were to be part of the Manassas campaign under GEN McDowell, logistical and technical difficulties prevented their use.

Aeronaut John Wise suffered virtually the same fate in his efforts at Manassas. John La Mountain, however, the third aeronaut to try his hand at aerial observation for the Union Army, finally succeeded where the others had failed. In August 1861, while he was attached to GEN Butler at Fortress Monroe, his repeated ascensions resulted in critical observations that were reported to GEN Scott, commander of all Union forces.[16]

In December, La Mountain experimented with "free" balloons, in which he would float over enemy territory for observations and then ascend several thousand feet until he reached winds that would take him back to friendly lines. By the summer of 1862, Lowe was ascending almost every day. The Balloon Corps now had seven balloons operating under La Mountain and Lowe. But the success was short-lived; in June of 1863 the Corps was disbanded.

Analysis of Aerial Reconnaissance

Aerial reconnaissance was a tremendous success technically and operationally but a dismal failure administratively.[17] Technically, the Balloon Corps had the best ballooning equipment available. Other logistical requirements were hit and miss; the Corps possessed 12 of the best mobile hydrogen generators available but suffered from a critical shortage of technical assistants and maintenance personnel. Operationally, the results were outstanding. Communicating the critical observations was done by three methods: visual signals with flags (limited use), dropped messages (weighted on a ring down the cable), and telegraph. Written reports followed each ascent.[18] The importance of the observations is validated by their place in the high command planning process. It was Lowe's reports from a balloon that calmed the fears in Washington about possible advancing Confederates after the defeat at Bull Run.[19]

As for the enemy, as early as fall of 1861 the Confederates were issuing instructions on countermeasures against balloon reconnaissance, including camouflage, concealment, deception, and light discipline.[20] Despite operational success, the administration of the Balloon Corps proved to be its "Achilles' heel." Civilian aeronauts' commanding military assistants, their reporting operationally to one branch and administratively to another, and Lowe's often paying bills out of his own pocket—all together proved an unworkable system.[21]

Balloons and aerial reconnaissance returned to the Army as part of the Signal Corps for the battle of San Juan Hill in Cuba in 1898. The new Balloon Detachment became interested in the latest developments of ballooning in Europe: the engine-powered, steerable "dirigible" balloons. Within 10 years, the Aeronautical Division of the Signal Corps was created, and the first Army military "Baldwin" airship (dirigible) and "Wright Flyer" (from the Wright brothers) were under contract. Soon after, the Air Corps was made a separate unit within the Army and eventually became the Air Force.

Aerial reconnaissance in balloons introduced the sky as the high ground. It became evident in the Civil War that access to the sky was critical in planning strategic and tactical operations. The modern use of aerial observers and AWACS, as well as constellations of surveillance satellites, grew out of these early Army attempts to seize and exploit the high ground of the sky.

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1 Mead, Peter, *The Eye in the Air* (Her Majesty's Stationary Office: London, 1983): 2.

(Continued on Page 31)

The Army—A Leader and Partner in Pioneering "The Final Frontier"

by LTC Patrick H. Rayermann

LTC Patrick H. Rayermann

Lieutenant Colonel Patrick H. Rayermann, U.S. Army Signal Corps, is Chief of Space Operations at DISA.

A Historical Perspective

The Army has pioneered important contributions to the Nation's future throughout the history of the United States. In addition to its core responsibilities of warfighting and preserving the national security, the Army has also served a key role in building the Nation. Just as the Army played a key role in the expansion of the Nation throughout the western frontier, it is contributing to America's exploration and exploitation of "the final frontier."

Nation building used to be a pre-eminent aspect of the Army's daily role. The U.S. Military Academy at West Point was recognized throughout the 19th century as one of the Nation's finest engineering schools. Many young men applied for appointments to West Point, not with military careers in mind, but rather with the aspiration of becoming engineers who would help to build the roads, bridges, canals, towns, and cities required by a vibrant, growing nation. Captains Merriwether Lewis and William Clark and Lieutenant Zebulon Pike are remembered, not for their battlefield accomplishments, but for the pioneering contributions they made exploring what, at the time, was the great unknown western frontier.

New Frontiers

This aspect of the Army's contributions and the spirit behind it did not disappear with the advent of the 20th century; it continues to be very much alive. During the first half of the century, the Army developed the use of aircraft and air power to the point that a third military service, the Air Force, was created.

As World War II drew to a close, some Army leaders recognized the powerful potential of the German V-2 rockets. OPERATION PAPERCLIP was successful in finding the engineers who created the V-2 and bringing Dr. Wernher von Braun and much of his rocket team to White Sands Proving Ground, N. Mex.

The Army integrated Dr. von Braun and his team into Redstone Arsenal and the new Army Ballistic Missile Agency (ABMA). Although they developed rockets for military requirements, they also kept in mind other possibilities—quite literally including flights to the moon—which led to their design and the initial development of the Saturn family of rockets during the 1950s, well before any formal Space program.

The Army also sponsored the Jet Propulsion Laboratory (JPL), an organization nominally affiliated with the California Institute of Technology (Caltech). Led by Dr. William Pickering, the JPL developed and fielded the Army's WAC Corporal and Sergeant rocket systems. The JPL gave the Army not only another group experienced in the development and employment of rocket systems, but a team of people who were among the leading pioneers and innovators of guidance, telemetry, and miniaturization of electronics for devices operating at high altitude and/or with rockets.

Man's First Extraterrestrial Launch

In February 1949, von Braun's team and the JPL achieved a little-remembered first: they launched a WAC Corporal rocket atop a V-2 rocket. Dubbed Bumper-WAC, the Corporal rocket achieved an altitude of 250 miles and was the first manmade object to reach extraterrestrial Space. With JPL, the Army had an organization that was prepared to build experimental payloads designed for the rigors of rocket flight and high altitude.

International Geophysical Year

During 1954 and 1955, with the coming of the International Geophysical Year (IGY) (July 1957–December 1958) in mind, each of the U.S. military services lobbied to be appointed to lead the Nation's effort to place the first manmade object in orbit. Although the Army had a clearly mature capability with its Redstone rockets, President Dwight D. Eisenhower was adamant that the military should not lead the way into Space; he preferred a civilian effort. So a project that built on U.S. Navy sounding rocket experiments but was nominally under the civilian leadership of the National Science Foundation (NSF) as Project Vanguard was given the go-ahead to launch a satellite before the end of 1958.

A Soviet representative told members of the international IGY committee in September 1956 that the USSR would launch a sat-

ellite as part of the IGY. However, few in the West recognized that the Soviet Union—under the leadership of Sergei Korolyov, a native rocketry genius—had been making great advances. In August 1957, the Soviet Union conducted the first successful launch of Korolyov's Semyorka [R(ocket)-7]. Although publicly announced, this launch received little media notice in the West, which had no idea how large or powerful the rocket was. Two months later, the third successful launch of a Semyorka, on Saturday, Oct. 4, 1957, drew international attention. It lofted the 184-pound *Sputnik* into orbit and sent the West, especially the United States, into a tizzy.

By chance, MG John B. Medaris, the commander of the ABMA, and von Braun were hosting the new Secretary of Defense, Neil McElroy, in Huntsville. When word came of *Sputnik*, von Braun said that the Army could be ready to launch a satellite within 60 days of being told to do so; however, Medaris stated a more cautious 90 days. McElroy conveyed this offer to the White House. However, the president initially preferred to stick with the Project Vanguard effort.

The Army orbited a useful scientific payload that, on the Nation's first space mission, discovered the Van Allen radiation belts.

The launch of a second Sputnik, on Nov. 3, 1957, further shocked the United States. For the Army, though, the news shortly had a silver lining. Medaris, von Braun, and Pickering received welcome news on Nov. 8, 1957, when the Army was authorized to proceed with preparations to use a Jupiter-C rocket to launch a satellite. However, all three resented the authorization to merely prepare a rocket. In a joint message to the Department of the Army, they stated their mutual intent to resign if authorization for also launching their satellite were not forthcoming. They got it.

On Dec. 6, 1957, in full view of the international news media, the NSF countdown proceeded to zero; the Vanguard rocket ignited and slowly lifted off the pad—to an altitude of some six inches—whereupon the vehicle fell back on the pad, settled, and immolated itself. In the ultimate embarrassment, the Soviet Union publicly offered to provide technical assistance to the obviously technologically inferior Americans. However, this dismal demonstration also gave the full green light to the Army team to proceed with their launch.

Fifty-six days later, on Jan. 31, 1958, within Medaris' 90-day commitment, they succeeded. The JPL-built *Explorer I* satellite was put into orbit atop a derivative of the Redstone rocket: the Jupiter C with a second and third stage at the top and the *Explorer I* nestled in the center of the two upper stages. *Explorer I* achieved a significant first; it activated a complete radiation-detecting experimental payload and the telemetering electronics required to transmit the experimental measurements to the ground. The Soviet's *Sputnik I* contained a transmitter only and so could accomplish no useful science, and even *Sputnik II*, with the dog Laika aboard, provided but a simple transmission of the dog's heartbeat. The Army orbited a useful scientific payload that, on the Nation's first space mission, discovered the Van Allen radiation belts.

Whither the Military and Space?

During 1958, the military built on the success of *Explorer I*. Project Vanguard successfully orbited a satellite on its second attempt. The Army's Signal Corps orbited Project SCORE, which broadcasted a pre-recorded message to the world from President Eisenhower. The Air Force developed plans for its own Space efforts, using the ballistic missiles it had been developing: Thor, Atlas, and Titan. The President authorized the creation of the Advanced Research Projects Agency (ARPA) as the nation's first Space agency. This authority, however, was short-lived, as the President decided to create the National Aeronautics and Space Administration (NASA). NASA was approved in July 1958 and activated on Oct. 1. In December, Dr. von Braun and his team were transferred to NASA, and the agency was redesignated the Marshall Space Flight Center (named for General of the Army, Chief of Staff, and Secretary of State John C. Marshall). Pickering and the JPL were assigned to NASA on Jan. 1, 1959. About this time, the Army was also directed to transfer its Jupiter ICBM program to the Air Force. The Army, after leading America into Space, barely a year later had lost the organizations, people, skills, and expertise it had invested 15 years in building!

Although the Air Force envisioned a vigorous Space effort under its leadership—including plans for launch vehicles; a hypersonic, manned "spaceplane;" an orbiting space station; and a manned lunar base—it had difficulty obtaining the funding needed to develop these programs fully. Ultimately, only the programs for launch vehicles came to fruition.

Continued Evolutionary Employment

The '60s and '70s saw only rudimentary participation in Space exploration and exploitation by the military services. The Army,

working as a partner with the Air Force and the Defense Communications Agency, helped to develop satellite communications, creating the Defense Satellite Communications System (DSCS). In the late '70s, the Army provided leadership by creating the Tactical Exploitation of National Capabilities (TENCAP) program—a first step toward providing battlefield commanders with access to information gleaned from orbiting Space systems.

The Army Refocuses on Space

The Nation's Space capabilities matured in the '80s, epitomized most visibly by the first flights of the reusable Space Shuttle. Operational Global Positioning System (GPS) satellites were launched, as was the Navy's FLEET Satellite communications system (FLEETSAT), and the third generation DSCS satellites began to be orbited. The Services began to recognize an emergent dependence on Space capabilities and the need to treat these capabilities as essential elements of the operational force. On Oct. 1, 1982, the Air Force Space Command was formed, and one year later the Navy followed suit, activating the Naval Space Command. These actions led to the activation of USCINCSPACE in 1985. The first Army astronaut flew in Space in 1985 when COL Robert Stewart became the second of two astronauts to test the Manned Maneuvering Unit (MMU) by flying as an independent, untethered human satellite.

The Army began to recognize that reconnaissance, navigation, and communications capabilities relying on Space systems were becoming vital to future Army warfighting needs. In 1985, the Army created for its officers the Additional Skill Identifier (ASI) 3Y, recognizing those officers with experience and skills in Space activities.

General Maxwell Thurman, the Vice Chief of Staff of the Army, commissioned the formation of the Army Space Initiative Study (ASIS). Thirty officers and one civilian met for six months researching current Army doctrine, the capabilities of various DoD and other organizations to exploit Space and Space technology, and likely emergent capabilities for the next 25 years. Among their recommendations that have become reality: creation of an Army Space Command, creation of Regional Space Support Centers, and creation of a functional area for Space officers in about the year 2000.

In 1986, the Army Space Agency was activated. On April 7, 1988, the Army Space Agency became the Army Space Command (ARSPACE) and was given responsibility for the operations centers controlling the communications payloads on the DSCS satellites and for creating Regional Space Support Centers that were subsequently established in Arlington, Va.; Oahu, Hawaii; and Vaihningen, Germany. Designated as the Army's component to USCINCSPACE in 1992, the Army Space Command was realigned under the Army's Strategic Defense Command (a successor of the 1950's ABMA), which was redesignated as the Army's Space and Strategic Defense Command (SSDC). These organizational relationships have continued since, although in 1997 SSDC was renamed the Space and Missile Defense Command (SMDC).

ARSPACE accomplishments have been varied and important. ARSPACE played an essential role in expeditiously fielding large numbers of GPS receivers known as Small Lightweight GPS Receivers (SLGRs) to forces deployed to DESERT SHIELD and in training soldiers how to use them. The ability to navigate precisely across vast trackless desert using GPS gave the United States the ability to execute its subsequent sweeping attack deep into Iraqi territory. The use of satellite communications by tactical forces has increased tenfold; the operational focus and single focal point provided by the RSSCs have facilitated this expanded use. The provision of imagery and maps created from data collected from Space has become a routine service offering of ARSPACE. Deployed forces today receive reliable warning of theater-level missile threats from the Joint Theater Alert Ground Station (JTAGS) systems operated by ARSPACE's 1st Space Battalion.

The Army began to recognize that reconnaissance, navigation, and communications capabilities relying on Space systems were becoming vital to future Army warfighting needs.

Army astronauts have continued to make significant contributions to the Nation's manned Space program, especially in preparing for a new, U.S.-led orbital Space Station. In particular, COL (Ret.) Jim Voss provided critical leadership for the joint efforts with Russia to bring the International Space Station (ISS) into being. At present, he is serving on the second crew to inhabit the ISS.

Who Gets the Credit?

Of the accomplishments in the exploration and exploitation of Space to which the Army clearly contributed, many cannot be attributed solely to the Army. The Air Force, Navy, NASA, other organizations, and other people can legitimately make a claim to the

credit for initiating, developing, and/or contributing to the idea.

However, claiming credit is not what matters. What must fundamentally be understood and appreciated is that the Army has been and continues to be involved in Space exploration and exploitation; the Army is an innovator and an indispensable partner in evolving the Nation's Space capabilities. What must be remembered is that as America advances into Space, the Army and the Nation cannot afford for the Army to not be an active, involved, and engaged partner.

What must be remembered is that as America advances into Space, the Army and the Nation cannot afford for the Army to not be an active, involved, and engaged partner.

A Responsible Outlook

Presidents Dwight D. Eisenhower and John F. Kennedy focused on the peaceful uses of Space. This approach has been a tenet of U.S. efforts and was embodied in the placard left on the moon by the *Apollo 11* astronauts. However, mankind's evolution is the result of struggle. The struggle between the ideal of democracy and the communist model of socialistic dictatorship prodded mankind into the "Space race" between East and West and arguably resulted in humans walking on the moon decades sooner than we might have done otherwise.

While we can hope for cooperation in and peaceful exploitation of Space, history suggests that, with our maturing Space capabilities and increasing reliance on Space systems, Space will become another medium in which wars are fought. Cyberspace has rapidly become a medium in which conflicts can be—and are—conducted today. Absent a dramatic technological revolution, for the next 25 years or more human conflict will continue to be centered around the territorial, resource, and political competitions on this world, the Earth.

Therefore, Space capabilities and emergent Space forces will be engaged as yet another means of achieving strategic or political goals here on Earth. In such a context, the Army must develop Space capabilities and be an active partner in employing them. This is no different from demanding that Army officers be conversant with sea and air power and competent in employing each as part of a total Joint warfighting package. To do any less would be a naïve abdication by the Army of its responsibilities.

Related Readings

Rumsfeld Commission Report

Background Papers presented to the Rumsfeld Commission

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What is Space Intelligence Preparation of the Battlefield (IPB)?

by LTC David G. Berge, MAJ James D. Patterson, and Mr. Owen B. Carleton

This article defines Space Intelligence Preparation of the Battlefield (Space IPB) and discusses how the FA 40 can effectively incorporate Space IPB into tactical operations. Several assumptions must be addressed to provide a common basis of understanding:

- Space IPB, at present, is nothing more than a buzzword. There is no solid Army doctrine, and Joint Space IPB doctrine is of limited use to the tactical army. Component pieces of IPB related to Space have been periodically worked in Army operations but never as anything that can be considered a complete package.
- The term IPB, whether related to Space or not, is so commonly tossed about that it carries a wide variety of potential interpretations. For instance, an S3 may tell the S2 that he needs an IPB when all that is actually required is a basic assessment of when the enemy will attack. Because of this lack of clarity, it is important for Space Operations officers to clearly define Space IPB.
- The IPB process is associated with the S2/G2 intelligence staff. Doctrinally, the whole staff is involved with IPB, but the bottom line is that the "2" is the focal point. S2/G2s will be receptive to the Space IPB effort conducted by the FA 40 if the "2s" are involved with the process.

The Space IPB process outlined in this article parallels the traditional Army IPB process outlined in FM 34-130, Intelligence Preparation of the Battlefield. A draft Space IPB Appendix (App J to 34-130) has been provided to the Intelligence Center at Fort Huachuca, Ariz., for incorporation into the updated FM 34-130. However, the updated 34-130 has yet to be published. Draft copies of Appendix J to FM 34-130 are available upon request from the ARSPACE G2.

The proposed definition of Space IPB is "The systematic application of the critical Space dimension to the tactical army commander's battlefield." Taking this definition, the challenge for the FA 40, as the new staff guy on the block, is to effectively integrate Space IPB into staff operations—especially in the realm of the Mission Development/Mission Planning effort. This article outlines steps by which the FA 40 can integrate Space IPB in a fashion that is practical and relevant and provides distinct value-added to the command. The bottom line is to identify understandably how Space will affect the ground fight. The process identified below is by no means all encompassing but can be accomplished in a reasonable timeframe by a single FA 40 assigned to the Corps staff. Listed below are the four primary steps necessary to accomplish Space IPB in support of tactical Army operations:

Step 1: Define the Battlefield environment. Army units operate in a defined area of operations (AO); for example, a 200- by 400-km area in Southwest Asia. The FA 40 task is to define the Space area of interest (AoI), which encompasses the region of Space above and adjacent to the supported command's AO (see Figure 1). All satellites moving through the identified Space AoI would be considered in the analytic process discussed in Steps 3 and 4 of this article. Additionally, the Space AoI includes select terrestrial locations (both in and outside the AO) that can influence the operation (i.e., a downlink location in another country that may be providing imagery to the

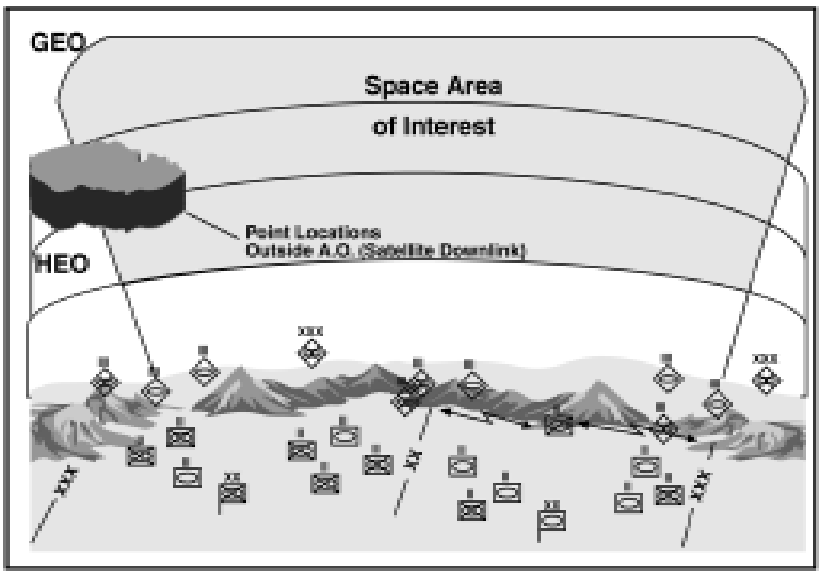


Figure 1. Defining Space Area of Interest

Lieutenant Colonel David G. Berge is the G2, Director of Intelligence and Security, for Army Space Command. Because ARSPACE is the operational element of SMDC, the G2 has taken on the responsibility to develop a Space analysis and training effort. Space IPB is a critical component of that whole process. Lieutenant Colonel Berge has been the ARSPACE G2 since 1998, and has a background in both tactical and strategic intelligence related assignments. Prior Space-related experience included being assigned to the NORAD/USSPACE J2 from 1992–95.

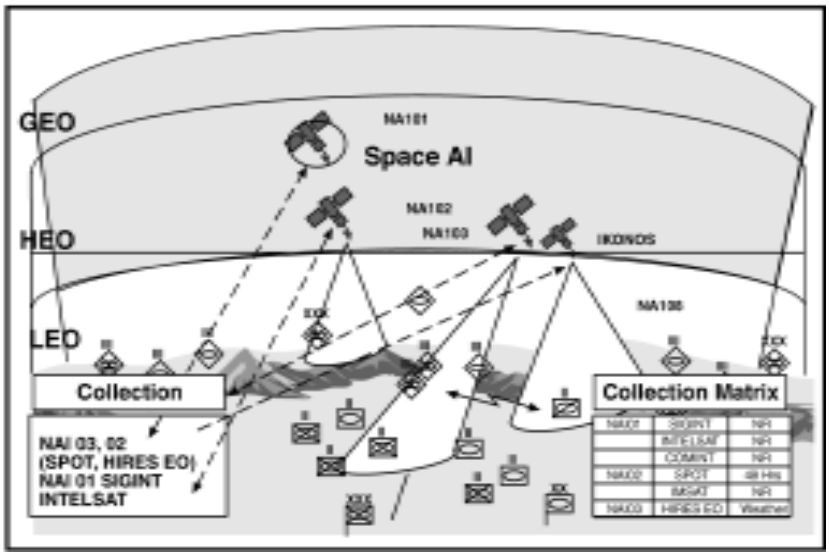


Figure 2. Space Event Template

enemy). As a bottom line, the Space AoI in relation to the supported command's AO must be defined so that the Army commander/staff officer can relate the familiar—the ground situation—to the Space environment.

Step 2: Describe Battlefield Effects. Solar weather, terrestrial weather, and the terrain can affect the battlefield. Traditional IPB conducted by the G2/Terrain team focuses on terrain and terrestrial weather analysis. The Modified Combined Obstacle Overlay (MCOO) is the culmination of this process—depiction of weather/terrain effect on operations. The FA 40 can complement the work done by the G2/Terrain team by addressing important weather/terrain issues specifically related to Space. These include:

- Solar Weather. Solar weather analysis includes the effect of Space AoI systems, and terrestrial systems within the command's AO [high-frequency communications; global positioning system (GPS); Defense Support Program (DSP); intelligence, surveillance, and reconnaissance (ISR); Defense Satellite Communication System (DSCS); and radar]. The solar events that need to be monitored include electromagnetic radiation, solar wind, ionospheric scintillation, and energetic-charged particles. The extremely intense solar flare activity, which occurred during the first half of April this year, demonstrated that intense solar activity can cause disruption to warfighter operations.
- Terrestrial Weather. The FA 40's lane should be limited to the effect of terrestrial weather on optimal satellite operations. Two examples are the effect of cloud cover on electro-optical imagery collection and the degradation high cloud cover can cause to Space-based infrared sensor data.
- Terrain Analysis. This analysis should include the effect of terrain-masking on friendly and enemy line of sight (LOS) access to satellites, the identification of optimum locations for satellite ground stations, and the effects of urban areas on LOS access to satellites.

Step 3: Evaluate the Threat. This part of the Space IPB process examines enemy Space capabilities and includes their use of Space assets and their ability to deny the United States the friendly use of Space. During Steps 3 and 4, the FA 40 should take advantage of the Space threat information available on the ARSPACE G2 SIPRNET homepage, on the USSPACE J2 Combined Intelligence Center homepage, and from his own G2 shop. Evaluating the Space threat includes analyzing:

- Enemy Space Applications. Identify how the enemy uses organic Space systems (economic, political, and military), other countries' Space support, and commercial Space assets.
- Space Vulnerabilities. Identify satellite downlink/ground site, launch sites, infrastructure, etc. This vulnerability analysis should include the development of a list of recommended Space high-value targets.
- Threat TPED. Evaluate the Tasking, Processing, Exploitation, Dissemination (TPED) process. Determine how quickly the enemy receives and processes collected Space information and how it disseminates the information to support targeting and situation development requirements.
- Space Negation Capabilities. This includes SATCOM EW, GPS jammers, laser, kinetic energy, etc., and employment doctrine.

The Space Event Template (Figure 2) can be useful in supporting the threat evaluation effort. The event template is a graphic representation of the potential disposition of the enemy Space threat and Space-based terrestrial infrastructure. Key components in this example include suspected locations of imagery satellites, friendly units that may be targeted, and a matrix showing timelines for data

dissemination. NAIs are located on templated locations so that our Space object identification collection effort is properly oriented. Figure 2 is a simplified example, and orbitology factors would need to be factored (i.e., the LEO bird may be in and out of the AoI within 45–90 seconds and then have a different look angle on its next pass).

Step 4: Situation Analysis. This analysis incorporates efforts from Steps 1 through 3 and adds an important assessment piece. The key tool and most important product of Step 4 is the Space Situation Template. This template depicts how the FA 40 believes Space will affect the supported command's operations. It can be a useful tool in integrating with the MDMP process and for briefing the commander on the anticipated Space situation. The Space Situation Template includes analysis of Blue Space, Red Space, and civil and commercial Space systems. It is a snapshot in time and should be developed to relate to a critical time in the operation, such as crossing the line of departure. Figure 3 is an example of a Space Situation Template.

The component pieces the FA 40 should develop as a part of the Space Situation Template are:

- The Space AoI as developed in Step 1. This lends perspective and focus to the Space analysis effort.
- The disposition of friendly/enemy maneuver forces which shows the relevance of Space to units on the ground. Once the commander/G3 sees the ground picture, he can better relate to how Space may affect or enable his battle.
- A depiction of where friendly ISR/COM/DSP satellites are and in which orbit. Utilizing the Space template, the FA 40 needs to explain how he thinks the friendly use of Space will affect the operation. This could include points such as: a) high pressure will allow for optimum employment of our EO systems until 6 p.m. (see low-pressure graphic on template); b) anticipate that the enemy will conduct extensive denial and deception to mislead our Space ISR; c) solar flare activity may disrupt DSP (solar graphic upper right), thus degrading our missile warning timelines; d) analysis shows that the enemy may focus electronic warfare against the communication satellite; and e) GPS provides accuracy assessments for weapon systems, navigation, and timing.

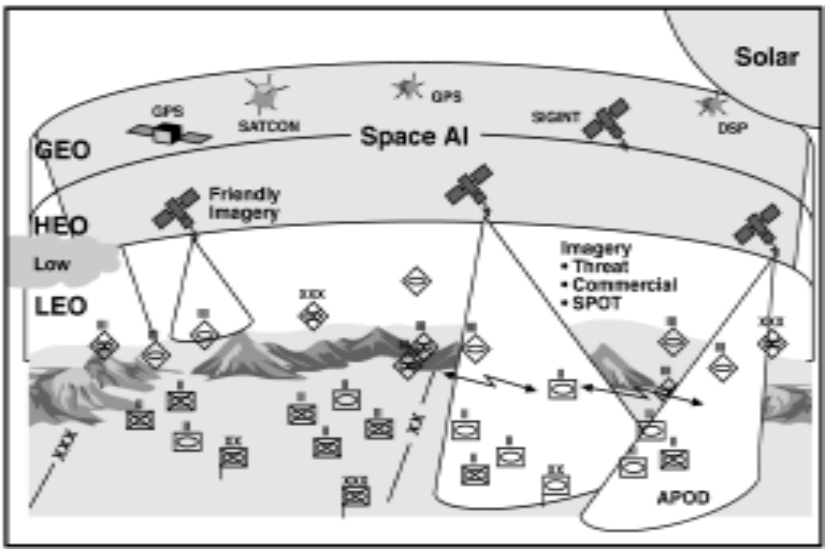


Figure 3. Space Situation Template

- A description of threat satellite locations and an estimate of how they will support the enemy commander's intent. The explanation should include: a) targets the enemy imagery systems may collect against and the timelines for enemy decisionmakers to receive the data (i.e., it takes two days for the enemy commander to receive the imagery, so they most likely will collect against fixed targets such as APODs, logistics bases, etc.); Figure 4 is an example of what can be developed to show links and timelines for enemy receipt of space collected intelligence; b) enemy reliance on satellite communications, including orbits, technical data, and potential vulnerabilities, which could be exploited; and, c) identification of other high-value targets, with recommended measures that could be taken to negate these Space-related targets.
- An evaluation of commercial system effects on operations, which might include: a) a threat that has a contract with commercial provider allowing the threat to receive up to one-meter resolution imagery within two to three days of collection; b) possible targets commercial Space technology may be tasked against; and c) (if known) what shutter control efforts are being worked through national policy channels.

The situation template can also be used

See IPB
(Continued on Page 34)

LTC Patrick G. Forrester

Lieutenant Colonel Patrick G. Forrester is assigned to the crew of the STS-105, which launched July 12. He operates the space shuttle robotic arm and performs a space walk to aid in the further construction of the space station. He has a bachelor of science degree in applied sciences and engineering from the U.S. Military Academy and a master of science degree in mechanical and aerospace engineering from the University of Virginia. He was assigned to NASA at JSC as an aerospace engineer in July 1993 and was selected as an astronaut in May 1996.

Army Astronauts Energize the NASA Mission

by LTC Patrick G. Forrester and LTC T. J. Creamer

"Man must rise above the Earth-to the top of the atmosphere and beyond–for only thus will he fully understand the world in which he lives."

– Socrates, 500 B.C.

Late in the evening, May 21, 2000: the U.S. Army truly owns the high ground. At this moment in time, 250 miles above the Earth, 100 percent of the human beings "walking" in space belong to the U.S. Army.

On that special night, LTC Jeff Williams and COL (Ret.) Jim Voss departed the protection of the space shuttle *Atlantis* to enhance the international space station (ISS). This all-Army extravehicular activity (EVA) is a prime illustration of the role that Army astronauts have come to play in the Army/NASA partnership as we continue together to explore the boundaries of space.

The U.S. Army has a proud tradition of contributing to our Nation's space program. In 1956, the Army Ballistic Missile Agency was established at Redstone Arsenal, Ala., to develop the Jupiter intermediate-range ballistic missile. On Jan. 31, 1958, an Army Jupiter C rocket placed Explorer I, the United States' first satellite, into orbit. Three years later, Army Mercury-Redstone rockets launched Alan Shepard and Virgil I "Gus" Grissom on suborbital space flights. In 1958, NASA was established, and two years later, the Army Ballistic Missile Agency was transferred to NASA to become the nucleus of the agency's space program. The Army has been on the front line of human space exploration ever since.

Selection History

Since the beginning of the space shuttle program, there have been ten groups (or classes) of astronauts selected for space flight. All but two of them have included an Army officer. And yet, to this day, most of the people we come in contact with are surprised when they find out that we belong to the U.S. Army—that the Army even has astronauts! When the average person thinks of the Army, his/her first thought is of an Airborne Ranger infantryman who wears camouflage, uses high-tech weapons, and deploys overseas. We are not a whole lot different from that, except that we have traded in our camouflage for NASA blue and our high-tech weapons for the space shuttle, and most of our deployments these days are to Russia, where we work with our cosmonaut counterparts to construct the ISS. It actually makes a lot of sense. The military experience we have acquired over the years—organization, teamwork, leadership, and being able to "make do" with limited resources—has a direct application at NASA.

The Army Astronauts

The NASA detachment, which includes six active-duty Army astronauts, is located at the Johnson space Center, Houston, Tex. It is part of the Army space Command in Colorado Springs, Colo., which is subordinate to the U.S. Army space and Missile Defense Command (SMDC). LTC Patrick G. Forrester recently took command of the detachment from Senior Army Astronaut COL Bill McArthur in order to allow him to train for his shuttle mission, which launched in October 2000. The other Army astronauts are LTC Jeff Williams, LTC Nancy Currie, LTC Doug Wheelock, and LTC "TJ" Creamer. The detachment helps the Army define its requirements for the space program and enhances the Army's use of space capabilities. Ultimately, these soldiers are Army and SMDC ambassadors to NASA.

The Army has long been a key player in NASA's space shuttle program. The first Army astronaut, COL Robert Stewart, orbited the earth in February 1984 on STS 41-B, where he became one of the first astronauts to maneuver untethered outside a spacecraft. However, success in the shuttle program is just the beginning. The space shuttle and two types of Russian rockets will conduct 45 missions to launch and assemble the more than 100 elements that will comprise the completed ISS. In all, 460 tons of structures, modules, equipment, and supplies will be placed in orbit by 2006. The ISS is the largest international cooperative space effort in history, and again, Army astronauts are playing key roles as they help with its construction and habitation.

Currie flew on the first U.S. station flight, STS-88, which launched a key module during the construction of the ISS. She was responsible for the mating of the U.S.-built module Unity with the on-orbit, Russian-built mod-

ule Zarya, using the shuttle's robotic arm. As mentioned previously, Williams and Voss flew on STS-101, using their skills in the replenishment of the fledgling space station. McArthur flew on STS-92 in October 2000. During this key construction mission, he participated in EVAs to help with the assembly process. Voss was one of the members of the second Expedition crew to live and work aboard the ISS. His mission began on Mar. 8, 2001, and lasted past mid-August. In August 2001, Forrester flew as part of the *Discovery* crew taking the third ISS crew to the space station and retrieved Voss and the rest of the Expedition 2 crew after their extended stay onboard.

Training and Other Duties

Although flying in space is the epitome of an astronaut's career, the actual time spent in orbit is limited. During a 10-year assignment with NASA, an astronaut will probably fly in space only about three times. Obviously, there is much more to being an astronaut than space flight. Despite the complexities of the job, an astronaut's ground duties can be broken down into two major categories: training for space flight and serving as a technical expert in some portion of the space shuttle or space station programs.

The technical jobs are numerous and varied, and much like an Army assignment. The Chief of the Astronaut Office will rotate the astronauts to help broaden their experience. For example, Currie has been the Chief of the Robotics Branch of the Astronaut Office. Similar to a program manager, she has been responsible for the engineering, development, and training of all robotic systems for the space shuttle and ISS. Currently she is training on the crew of STS-109, the next mission servicing the Hubble space Telescope, scheduled for November of this year. Prior to his dedicated training for his upcoming flight, Forrester was responsible for all crew training and onboard procedures for the space shuttle program. Wheelock currently spends most of his time in Russia, where he oversees the development of Russian hardware and procedures for the ISS. Creamer has been focusing on the command and control software and has been overseeing the international integration of the computers and networks onboard the ISS. Williams is currently managing the requirements development for a major upgrade to the shuttle avionics and cockpit displays.

Training time is coveted and always welcomed when it appears on a typically overbooked schedule. When not assigned to a flight, an astronaut receives training designed to maintain proficiency for space flight, usually including specific mission-task training. For example, it might include training on the remote manipulator system (the robotic arm on the shuttle) or training for spacewalks, which NASA calls EVAs. Astronauts also train on each of the shuttle and space station systems. Moreover, each astronaut maintains flight proficiency in the T-38N jet training aircraft. With the recent cooperative effort to build the ISS, Russian language training has become a must. Finally, with what little free time is left, astronauts are expected to maintain a high level of physical fitness.

Public Relations

Another commitment for astronauts is public relations. With thousands of requests for astronaut appearances coming to the office on a regular basis, astronauts must pick and choose where to spend their time. Army astronauts are well aware that their opportunity to serve in such a challenging and prestigious assignment is the result of a lot of hard work and commitment by others. They feel obligated to "give something back" to those responsible for making it all possible. Thus, giving back to the Army is always a top priority. Army astronauts also appreciate the support provided by the Army leadership. For example, the night before her first shuttle mission in 1993, Currie received a fax from then Army Chief of Staff GEN Gordon R. Sullivan. He wrote: "Your craft will never be out of sight of an American soldier serving somewhere in the world." That is a fact that they never forget.

Space Operations Officers

It is not just the astronauts who are taking the highest of high grounds, though. We know concretely that the successes of the space program rest on the shoulders of a great many who are supporting the astronauts. Here, too, the Army is ever-present.

At the Johnson space Center in Houston, talented and gifted Army officers work as engineers, coordinative integrators, and the equivalents of program managers. These officers are truly the team players making today's space program the success we see today.

MAJ Rob Johnston is the manager of all of the space station's element-to-element physical interface testing. This includes coordinating among multiple NASA organizations and private contractors, as well as orchestrating test events and formulating resolution plans for all discrepancies found. In addition,

LTC T. J. Creamer

Lieutenant Colonel T. J. Creamer is currently the support astronaut assisting Expedition 3, the third crew to live on the ISS. His technical focus has been the command and control software of the space station, as well as designing and coordinating the operational local area network to support the onboard activities for all international partners. He has a bachelor of science degree in chemistry from Loyola College of Baltimore, Md., and a master of science degree in physics from MIT. Creamer was assigned to NASA's JSC in 1995 as a Vehicle Integration Team engineer and was selected as an astronaut in June 1998.

Johnston supports NASA's Mission Control Center (MCC) during all spacewalks.

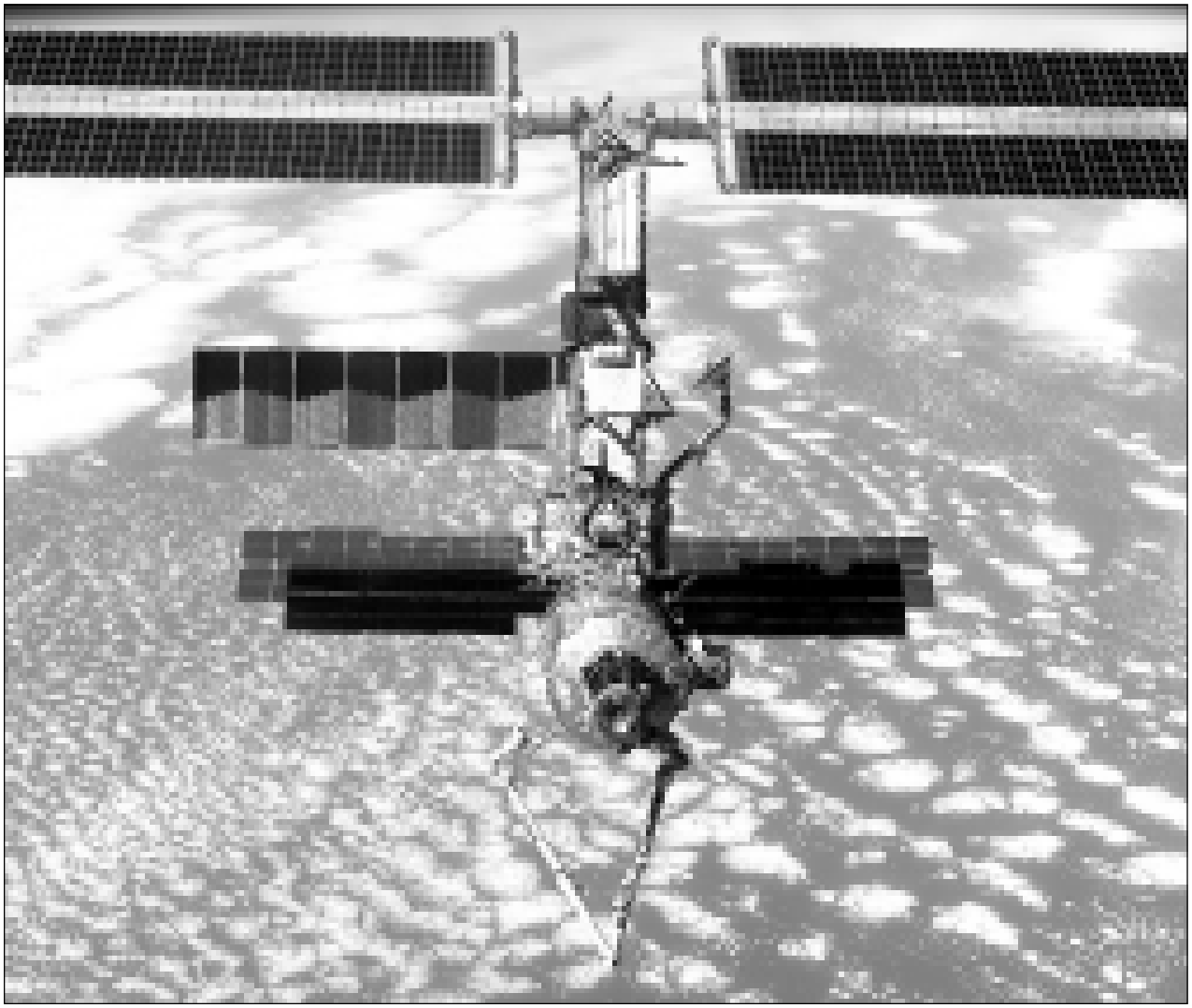
MAJ Robert "Shane" Kimborough is a flight simulation engineer, training both commanders and pilots in the shuttle training aircraft (STA). This is a modified Gulfstream II aircraft that provides the pilots a realistic ride, faithfully simulating the landing phase of their mission. The STA acts and feels like the actual shuttle during an approach. During the training, Kimborough acts as the co-pilot.

MAJ James "Tony" Moffatt focuses on space station hardware testing and integration. His job ensures that all space station elements are compatible. Think about this for a second. All power connections, fluid connections, data connections, fittings, and dimensions among all the elements must be perfectly coordinated and verified prior to reaching orbit. This is no small challenge!

MAJ Scott Rauer is currently a vehicle integration test engineer who represents the astronauts concerning space hardware, ensuring that ISS hardware components are safe for EVAs. He is also responsible for coordinating the progress and development of Japanese modules bound for the space station.

Conclusion

Space is the ultimate high ground, and as recently demonstrated, the Army's soldiers and soldier-astronauts are part of the joint team leading the way. Make no mistake: in virtually every aspect of today's manned space flight program, the Army is involved. Our goal will always be to ensure that space technology is there to support our fellow soldiers, the Nation, and the world in this new millennium.



(Photo courtesy of NASA)

The *International Space Station* as seen from the space shuttle *Endeavor* April 29, 2001, sporting a readily visible new addition in the form of the Canadarm2 space station robotic arm.

Space Operations Officer Receives Prestigious Award

Space Operations officers now have opportunities to be recognized for the significant contributions they make to the Nation's Space program.

The Rotary National Award for Space Achievement (RNASA) Foundation's Stellar Awards are presented to outstanding individuals and teams from industry and government whose recent accomplishments hold great promise for furthering our future successes in Space. Individual nominations are placed in the categories of recent graduate, early-career, mid-career, and late-career. A committee of distinguished scientists, engineers, managers, and academicians evaluates nominations. Recommendations are presented to a committee of foundation members who make the final selection. In the past, the awards have gone to civilians in technology and research.

This year, the U.S. Army Space and Missile Defense Command (SMDC) Force Development & Integration Center (FDIC) Space Operations Officer Management Office nominated three Army officers in different categories: COL Glen Collins, LTC Brad Baehr, and MAJ Christopher Baker, and one team, the Army Space Support Company, for awards. Collins, the director of the FDIC, won the mid-career Stellar Award.

Baehr, who works with Battle Lab-West, was nominated for his significant contribution in making the use of Space assets a reality for Army warfighters. As one of the Army's first Space Operations officers, his considerable skills increased the Army's awareness of Space technology and its involvement in the future development of Space equipment. Baehr's competence on the job and in committees advanced the role of the Space Operations officer from a career option on the books to a career officer desired at all levels of operation.

Baker, of the U.S. Army Space Command (ARSPACE), was nominated for providing ongoing Space expertise, analysis, and products to a myriad of Army warfighting units, including the Army's premier XVIII Airborne Corps, Fort Bragg, N.C.; the Eighth U.S. Army, Korea; and the Special Operations Forces (SOF) in various theaters of operation.

The Army Space Support Company (ARSSC) of the 1st Space Battalion, ARSPACE, was recommended for providing direct, continuous, and innovative analysis, expertise, and Space products as an integral staff element within Army task forces, corps, divisions, separate brigades, and SOF during exercises and military operations in Bosnia, Haiti, Korea, Kosovo, and OPERATIONS DESERT SHIELD/STORM.

SMDC has been gaining recognition from the rest of the military community as a leader in leveraging Space assets for the ground warfighter. The Stellar Awards have now recognized a Space Operations officer, COL Collins, for his ongoing, long-time contributions to Space.

". . . Army Space officers are making a difference and receiving recognition for their accomplishments."

– COL Glen Collins

Honored on Mar. 2 at the 15th Annual National Space Trophy Dinner at Space Center Houston, Collins was recognized for "the respect (he) has earned and for (his) hard work and exceptional accomplishments" in Space achievements.

"I am especially pleased that we had three of our Army Space officers nominated for this award," said Collins. "This is another example of how Army Space officers are making a difference and receiving recognition for their accomplishments."

Collins was cited for a long list of achievements:

- From 1996 to 1999, he served at SPACECOM as vice division chief of current operations and chief of the future operations branch. In this capacity, "he developed organizational structures and practices to implement a new mission directed by the U.S. President's Unified Command Plan for 1997," according to his award nomination. This mission designated SPACECOM as the single point of contact for military Space Operations. To this end, Collins immediately established detailed procedures to bring together disparate Space activities and assets. He also wrote comprehensive plans and orders to ensure the right Space support was provided to warfighting operations around the

world. His leadership "ensured that his plans were successfully real-time tested in 1998, supporting Iraqi "No Fly Zone" protection in OPERATION DESERT FOX," according to the SMDC nomination package. The plans were again remarkably executed by synchronizing Space support for the Kosovo air campaign in 1999. This led to "wide recognition of him as one of the military's primary experts in policy and doctrinal issues concerning command and control of Space assets," according to his nomination package.

- In spring 2000, he culminated his studies at the Army War College by publishing a paper entitled, "The Integration of Space Forces in the Unified Command Structure." The paper addresses national-level policy decisions on how to resource and train Space forces.
- As FDIC director, Collins continues to lead the Army's advancements in the uses of Space technology. "His is a respected voice to the congressionally appointed Space Commission, the body assessing U.S. national security Space management and organization," according to the SMDC nomination package. He also serves as the spokesman to integrate Space into the Army Chief of Staff's Transformation initiatives. As FDIC director, he is also responsible for developing and expanding the new career field of Space Operations for the Army. As a result, Army Space Operations officers attended their first career course in June 2001.

Continuing Stellar Awards Participation

"The proponent office of FDIC will ensure that this is an annual event and send Army Space officers who are making a difference to compete—and win," said Collins. "I encourage all of our leaders in the Army Space community to be on the watch for our best Space officers and nominate them for the Stellar Space Award."

Nominations are being accepted for the 16th Annual National Space Trophy. This trophy is presented to an outstanding American who has made major contributions to the U.S. Space program. More information about this award and the RNASA can be obtained from FA40-SPACE@smdc.army.mil. A full list of the winners for the 2001 Rotary National Award for Space Achievement (RNASA) Foundation's Stellar Award can be seen at http://www.stellarawards.org/.

FA 40 –

(Continued from Page 7)

LTC Michael Hegarty
LTC Jeffery Hill
LTC John Lloyd
LTC Patrick Rayermann
LTC William David Reese

YG 82

LTC Geoffrey N. Clymer
LTC Tim Coffin
LTC T. J. Creamer
LTC Charles N. Hardy
LTC Scott F. Netherland
LTC Michael H. Postma
LTC Earl B. Wardell
LTC Kurt M. Woods

YG 83

LTC Robert B. Baehr
LTC Todd E. Day
LTC Jeffrey M. King
LTC Daniel G. Modica
LTC Bruce G. Smith
LTC Willow A. Solchenberger
LTC Douglas Wheelock

YG 86

MAJ Bryan K. Adams
MAJ Bryan S. Boyce
MAJ Jeffrey A. Farnsworth
MAJ Patrick F. Frakes
MAJ Eric P. Henderson
MAJ Raymond J. Maier
MAJ Scott A. Parks
MAJ Robert A. Spuhl
MAJ Waymon E. Stallcup
MAJ William E. Whitney
MAJ Don L. Wilkerson

YG 87

MAJ George Andary
MAJ Gary Arnold
MAJ Stephen Benavides
MAJ Dennis Campbell
MAJ Scot Cuthbertson
MAJ Richard Dow
MAJ Dawn Eisert
MAJ John Graham, Jr.
MAJ John McDaniel
MAJ Michael McFarland
MAJ James Meisinger
MAJ Alan Personius

YG 88

MAJ Dennis Brozek
MAJ Robert P. Fabrizzio
MAJ Lee Patrick Gizzi
MAJ Thomas James
MAJ Robert Klingseisen
MAJ James D. Pruneski
MAJ Gordon Quick
MAJ John Rooney
MAJ Clay Scherer
MAJ Andrew Weate
MAJ Saundra Rene Yanna

YG 89

MAJ Timothy Bock
MAJ Joseph Bolton
MAJ Daniel Cockerham
MAJ Roger Kashaninejad
MAJ Patrick Marshall
MAJ Fernando Juan Maymi
MAJ Troy Dean McKeown
MAJ James Rozzi
MAJ Mark Vandehei
MAJ Darius White
MAJ George David Wingfield

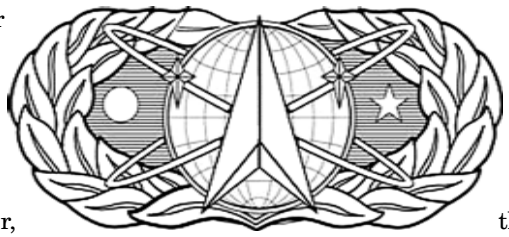
YG 90

MAJ Steven Choi
MAJ Jay Curry
MAJ Todd Dellert
MAJ John Driscoll
MAJ Anthony Guerriero
MAJ Ralph John Litscher
MAJ Christopher Livingstone
MAJ Victoria Miralda
MAJ James Patterson
MAJ David Strombeck
MAJ Lemuel Williams

Space Badge: The EIB of the Military Space Professional

By MAJ Dawn Eisert and MAJ John M. Graham

In January 2001, the Deputy Commanding General-Operations (DCG-O) for the U.S. Army Space Command (ARSPACE) initiated actions to adopt an Air Force Space Badge for wear by Army personnel. He wanted Army Space officers to be recognized for their unique knowledge and capabilities as they interacted with their operational brothers and their peers in the Air Force Space Command (AFSPC). As the DCG-O stated, "My FA 40s in the field are working hard to establish their credibility in Space Operations and Space force enhancement. I want a Space badge that recognizes their expertise and distinguishes them from other branches and functional areas." Two action officers consulted with knowledgeable leaders at ARSPACE, the Force Development and Integration Center, the Space and Missile Defense Command Battle Lab, and a number of Army retirees familiar with the badge lineage to begin the pursuit.



First stop for these action officers was Lt Gen Roger G. DeKok, vice commander of the AFSPC. When he was a young major in 1982, he was the action officer for the Air Force Space Badge. Fortunately, Maj DeKok received a great deal of guidance from Gen Jerome O'Malley, the true father of the AFSPC, and Gen James V. Hartinger, the first commander of AFSPC and the first Space officer to wear the badge. With this level of backing, DeKok put out a call for designs.

Initially, the call for designs granted DeKok six submissions from across the Air Force. Designs that were take-offs on the Missile Badge were rapidly dismissed as not representative of the new mission and capabilities of the Space force. Of the remaining designs, the senior leaders focused on those that used the Delta as the central theme, and a final design was drafted. While symbolically motivated, a few modifications were made to support the casting and manufacture process that had to occur to make the pins and embroidered patches distinctive to the naked eye from a distance.

The most prominent portion of the Space Badge is the Delta in the center. DeKok considered the Delta an essential representation of a rocket's upward thrust into Space. Because the Army Ballistic Missile Agency (ABMA) was the first to launch an American satellite, the *Explorer I* on a Jupiter C rocket, the Delta is also an appropriate representation of the Army's leadership in Space. In fact, the ABMA insignia of the time was an upward-thrusting rocket between two lightning bolts. Today, the 1st Space Battalion crest has a flying Delta moving above the globe.

In keeping with this tradition of excellence, DeKok told the Army action officers, "For those who share the common thrill of being involved in Space Operations, I welcome each and every one of them to wear this badge proudly, and I am proud to be among those who are qualified to wear this badge."

Subordinate to the Delta, the Space Badge includes a globe, orbits, and a star and a globe on blue shading. The centrally dominant globe represents the Earth as viewed from Space, the Earth being both the origin and control point for all Space satellites. The lines of latitude and longitude emphasize the global nature of Space Operations. The emblem is provided its distinctive appearance by two symmetric ellipses, representing the orbital paths traced by satellites in Earth orbit; the satellites are symbolically depicted as four-point stars. The 30-degree orbital inclination and symmetrically opposed placement of the satellites signify the worldwide coverage provided by satellites in accomplishing the surveillance and communications missions. The slight tapering of the orbital ellipses represents the characteristic eastward motion. Lastly, the distinctive dark blue background shading, small globe, and stars symbolize the Space environment.

The action officers then met with Maj Gen Howard J. "Mitch" Mitchell, AFSPC Director of Operations (DO) and the authorizing authority for the Space Badge under Air Force Instruction (AFI) 36-2923.

Many Army personnel believe that the Space Badge is an Air Force specialty code insignia equivalent to Army branch insignia.

Major Dawn Eisert is the Executive Officer in the office of the Deputy Commanding General-Operations, ARSPACE, Colorado Springs, Colo.

Major John M. Graham is the director, Space Fundamentals Course, Colorado Springs, Colo.

This is not entirely true for the Space Badge. The Space Badge is indicative that the wearer is in a Space career field and possesses special skills relating to military applications of Space. Similar to how only an infantryman can wear an Expert Infantryman's Badge (EIB), the Space Badge is restricted to wear by officers and enlisted soldiers in a Space career track who have met requisite qualifications.

These qualifications are outlined in AFI 36-2923. For the Air Force officer, two of three requirements must be met. They must be in career field 13S and have completed either the six-month Space initial qualification training, or officers not initially assessed to 13S must have completed the seven-week executive Space training course and possess Space experience. (This course is currently being reviewed for termination by the Air Force as they have now grown a Space cadre among lieutenants since 1982.)

. . . the Space Badge is the first step to recognizing the Space Operations officer as possessing special skills . . .

The DCG-O, designated as the Space Badge Wear Authority for ARSPACE by AFI 36-2923 and PERSCOM Memorandum dated May 17, 2001, used these standards in determining commensurate standards for Army personnel. His overriding concern was that we, the Army, have and will keep high standards before a skill-identifying badge is added to a soldier's uniform.

He also was adamant that the soldiers possess Space knowledge or capabilities that make them value-added as a warfighter. The first standard a soldier must meet is that his career is tied to Space Operations. At this time, the only soldiers that meet this standard are the 31S1C and the FA 40. As we continue to grow the Army Space force in size and relevance, other military occupational specialties are likely to be included.

Once an officer has been assessed as an FA 40, he or she is not automatically authorized the wear of the Space Badge. Using the EIB model, the FA 40 must now qualify to wear the Space Badge. The assessed FA 40 now has one of two ways to earn the badge: attend and graduate from the Army or Air Force seven-week Space course or have two years of service in a Space Operations position and have attended 3Y schooling.

This second option is a special "grandfather" clause, established by the DCG-O for FA 40s who will never be sent to the seven-week Space Operations officer course due to their accession year and Space experience. The requisite two years need to be in a Space-coded position that requires and applies Space knowledge. (If your last assignment was similar to mine, three years as a Human-Systems Engineering instructor at the U.S. Military Academy, there is "no joy" for a Space Badge.)

FA 40s applying for the Space Badge under the second option will submit a letter to the FA 40 Proponent, outlining Space experience and Space training. The proponent will validate the officer's application information and forward the request to the DCG-O. Once approved by the DCG-O, the AFSPC DO will award the Space Badge in accordance with the aforementioned Army and Air Force policies.

The Senior Space Badge and Master of Space Badge can follow the Basic Space Badge. The Senior Space Badge, the basic badge with a star, is authorized for wear after seven years of Space service. The Master of Space Badge, a senior badge with a wreath, is authorized for wear after 15 years of Space service. Applications for both must reflect years of creditable Space service and must be sent to the FA 40 Proponent.

For now, the Space Badge is a distinguishing insignia for the Army Space Operations officer. While we are all soldiers first, the Space Badge is the first step in recognizing the Space Operations officer as possessing special skills similar to our Army's redlegs, duck hunters, grunts, and scouts. Furthermore, it is now the recognized badge of Space expertise for the Army and Joint Force. However, if all goes well, the five-year vision is that we will have an "Army Space Badge."

Providing an Army Perspective to the NSSA

by MAJ David Strombeck

As an Army Space Operations officer, I know of varied job opportunities at all levels, such as tactical staff positions at Army corps, operational positions at U.S. Space Command and Army Space Command, and strategic positions at the National Reconnaissance Office and the National Security Space Architect (NSSA). Each has its own challenges and focuses. This article is a brief insight into a national Space organization and what roles future Army Space officers can play in shaping Space for the future.

Do you ever wonder if anyone is looking far into the future when it comes to Space? Well, there is an organization doing just that—the NSSA. The NSSA is a joint Space organization whose function is to look 10 to 25 years into the future and "develop and/or coordinate and integrate DoD and intelligence community (IC) Space system architectures for the mid- and long-term," according to the Memorandum of Understanding for National Security Space Management of July 31, 1998. They reach across the broad spectrum of Space/airborne users and providers to help guide and optimize Space for the future, from strategic to tactical users. The NSSA reports either to the Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (C^3I) or to the deputy director of Central Intelligence for Community Management, depending on the issue.

The NSSA is composed of a diverse group of people. It has a mixture of military and civilian DoD, IC, contractor, and research and development personnel. Of the military personnel assigned to NSSA, there are five authorized Army positions, with four Army officers assigned. All are either Space Operations officers (FA 40) or are transitioning to become FA 40s. The Army personnel at NSSA bring a wide array of experience, knowledge, and backgrounds to the table. We have a mix of technical and operational skills, which gives us an advantage over many of our service and technical counterparts. Additionally, some have had previous assignments with the U.S. Army Space and Missile Defense Command and Army Space Command (ARSPACE).

I have led troops at the platoon and company level and have served in tactical, operational, and strategic assignments. I have also worked at ARSPACE in the Remote Sensing Division and as a team chief for an Army Space Support Team (ARSST). This gave me valuable Space training and experience at the tactical and operational level. Working at the NSSA gives me a good macro-level view and strategic Space experience, which helps piece together another part of the massive Space puzzle. I strongly recommend that before Army personnel are assigned to national-level organizations like NSSA, they have previous leadership, tactical, and Space experience. This allows them to talk intelligently and confidently with their service counterparts and other Space community personnel about Army Space issues.

This wide array of Army experience, coupled with previous Space experience and knowledge, is invaluable to the Army at national-level Space organizations such as the NSSA. With other services and organizations providing a bulk of the manpower to many of these joint strategic Space organizations, it is imperative that the Army fill its authorized positions so that the Army's voice is heard concerning Space for the future. It goes back to the old saying, "out of sight, out of mind." If the Army isn't there to be counted, its requirements and needs may not be expressed as well as desired. An example is the integrated architecture team that I am presently working with. The team had not looked at future Army systems and Army future operational capabilities or really considered direct downlink. I was able to integrate the information and concepts into the team's focus.

The bottom line is that Army personnel at an organization like NSSA add a warfighter focus and are most definitely value-added. Although we work toward the good of the entire Space community, we are still green suiters and must ensure that the Army's voice is heard.

Major Strombeck is an 18-year soldier and former intelligence officer. He has served in tactical and strategic intelligence positions within the signals intelligence and human intelligence disciplines. He has completed a number of Space Operations courses and served with the Army Space Command from 1997 to 1999. He is currently assigned as a Space Operations officer to the National Security Space Architect.

LTC Thomas A. Gray

Lieutenant Colonel Thomas A. Gray is currently the Space and Missile Defense Command Liaison Officer to the U.S. Army Combined Arms Center at Fort Leavenworth, Kan. He served in the Army Space Command in the Army Theater Missile Defense Element Force Projection TOC and as the Executive Officer in the Space Directorate of the Space and Missile Defense Battle Lab.

Transformation

Space and the Interim Division

by LTC Thomas A. Gray

Editorial Note. *This is the first in a series of four articles that will outline Space in the interim force. This initial column discusses the basics of the Interim Division (IDIV). Future columns will further examine the IDIV and discuss how Space-based capabilities provide and enhance the critical characteristics of the division.*

The Army has recognized a need to change the way we are to fight based on the evolving world threat and the impact of technology for prosecuting military action. The future, leaders believe, lies in a Space-enabled Objective Force able to conduct full-spectrum combat operations. The time to meet the needs of the future is now. The path to follow will take us from a legacy force, through interim solutions, to the final Objective Force.

In the late 1990s, the Army was investigating the concept of a brigade-sized element, the Strike Force. The initial concept included Space Operations officers within the organization staff to integrate Space force enhancement capabilities. Efforts on the Strike Force concept were halted and the Army Transformation subsequently initiated, with the Interim Brigade Combat Team (IBCT) as the first building block of the Objective Force.

The vision is for the IBCT to be a unit of action employed in early entry operations under the control of an Army Forces (ARFOR) headquarters. The IBCT will be able to set the stage for follow-on forces in larger-scale combat operations.

Following the IBCT design, the Army recognized that the IBCT concept required a command and control headquarters in the area of operations (AO). That initiated the effort for redesign of the corps as an ARFOR with Early Entry Command Post (EECP) capability. That effort was put on hold to examine the design of the IDIV with ARFOR EECP capability.

Evolution or Revolution

Is Army Transformation a process of evolution or revolution?

Webster's Ninth New Collegiate Dictionary defines evolution as "a process of change in a certain direction: Unfolding." Revolution is defined as "a sudden, radical, or complete change." Either process has advantages and disadvantages.

A revolutionary change would require that several doctrine and training issues receive extensive development over time. A radical change from past methods of conducting warfare based on technological advances would require a tremendous effort from the developers and the soldiers who would implement the technology and use the systems.

Advantages for making an evolutionary change to the IDIV are that it is easier, costs less money, and takes less training time for the personnel involved. To transition from a legacy force to the interim force, the division should be able to become combat capable and be a functional organization in much less time.

One might see the IDIV as an evolutionary process, whereas the drive to the Objective Force is revolutionary.

Defined in the draft Operational and Organizational Concept (O&O), the IDIV provides the corps or joint force commander (JFC) with a strategically responsive, early entry ground force with capability across the range of Army operations. The IDIV is designed to be responsive, deployable, lethal, survivable, agile, versatile, and sustainable to defeat ground and air threats in the operational environment of the early part of the 21st century (2003–2010). When these characteristics are combined with the ability to gain, maintain, and exploit information superiority, IDIV can overmatch threat forces and dominate its AO.

The enhanced situational understanding within the IDIV allows maneuver forces to move to points of positional advantage with greater speed and precision, avoiding enemy strengths and combining the effects of direct and indirect fires (both lethal and non-lethal) to seize and retain terrain or destroy enemy forces. The division's common operating picture (in particular, improved target acquisition and tracking, coupled with indirect fire munitions and lethal attack helicopters) allows these systems to conduct operations with greatly increased lethality.

With more than a year of work so far and another year to go, the IDIV has gone through several iterations of designs and models. The design concept, as approved by the Chief of Staff of the Army, has some resemblance to

the legacy Army of today, with changes noted in the Air Cavalry Brigade, modified Brigade Combat Teams (based somewhat on the IBCT model), and a headquarters that includes a G5 (Plans) and G7 (Information).

The current effort for the IDIV includes the development and documentation of the O&O, the Operational Architecture, and the Table of Organization and Equipment.

The IDIV will be rapidly deployable and reliant upon information dominance, with additional support through "reach-back." To achieve this technological advantage over future adversaries, the IDIV will have an increased dependence on Space-based systems.

When deployed for combat operations, the IDIV command and control (C^2) system is normally organized into four distinct command posts: the tactical command post (CP), the main CP, the sustainment CP, and the home station support node (HSSN).

The Tactical CP is fully deployable. Its primary role is to prepare for, execute, and assess the current tactical operation. It also serves as the nucleus for the EECP. The division TAC CP is a small, highly mobile, and survivable CP normally located close to the forward brigades.

The Main CP is fully deployable. Its primary role is future planning. Command and control of the division while enroute to the AO is another primary focus of the main CP. It normally contains the division's command group and is a resource provider to the EECP. When deployed to the AO, it is kept as small as possible to minimize the CP's footprint. Its reach-back capability allows functions to remain in the ISB, sustainment command post, or HSSN, as appropriate.

The Sustainment CP is fully deployable. Its primary roles are sustainment planning, intelligence analysis, and executing C^2 of assigned ARFOR tasks. It may also command and control division logistics located at the ISB and A/SPOD during deployment. It provides EECP augmentation based on METT-TC.

The HSSN is a fixed organization at the division's home station; it does not deploy. It provides C^2 for the division's marshalling area during deployment and functions as a destination for reach-back communications, specifically personnel and deployment information.

Historically, the integration of Space technology into warfighting has been at the strategic and operational level of warfare. Though one can find the results of Space force enhancement at the tactical level, there has been very little direct integration of Space Operations in the division.

Today we see growth in Space technology for tactical operations through Global Positioning System receivers, satellite communications, tactical weather receivers, Tactical Exploitation of National Capabilities (TENCAP), and other venues. Some technical expertise exists within these tactical organizations; however, that knowledge is normally focused in narrow fields without any overarching integration for the entire unit. The level of experience at the lower echelons of organizations is limited, at best.

As the access to Space at the tactical level grows, so does the requirement for experts to assist in integrating that information. The Space Operations officers serving in the Space Support Element within the IDIV will be able to provide the expertise across the spectrum of Space Operations. In the next issue, we will look at the IDIV organization and the Space Support Element responsibilities to the commander, staff, and subordinate elements of the IDIV.

Graduation –

(Continued from Page 36)

E. Klingseisen, USSPACECOM; MAJ Patrick M. Marshall, Eighth U.S. Army; MAJ Jim R. Meisinger, 1st Space Battalion; MAJ Jim D. Patterson, 1st Space Battalion; MAJ Jim D. Pruneski, National Security Space Architecture; and MAJ Sean M. Scally, NRO.

Col. (P) Richard V. Geraci, deputy commanding general, ARSPACE and DCG for Operations, SMDC, awarded each graduate with the U.S. Air Force Space and Missile Badge. Cosumano pointed out that the awarding of the badge was a significant event.

Officials from FDIC, creators of the Functional Area 40 Space Operations Qualification Course, began the intense seven-week course June 15 in Colorado Springs, Colo.

Course instruction began with 25 days of classroom instruction. A week was then devoted to off-site visits to places such as the NRO, National Imagery and Mapping Agency in Washington, D.C., and Fort Bragg, N.C. This included hands-on training with Army Space Program Office, which developed Tactical Exploitation of National Capabilities Space support systems in use by Army warfighters.

The course concluded with a 43-hour command post exercise testing each student's proficiency in 24 individual critical tasks.

Plans are under way for the next two FA40 classes that are slated for January and June 2002.

A Review of Steven Lambakis' *On the Edge of Earth: The Future of American Space Power*

by MAJ John M. Graham

Major John M. Graham is the director, Space Fundamentals Course, Colorado Springs, Colo.

When I first read the introduction to Steven Lambakis' *On the Edge of Earth: The Future of American Space Power*, I was excited. Finally, an unclassified publication on military space that is written by a single author! To me, single authorship means a coherent product written at the same intellectual level with the same technical wording use throughout. While other books have been written on military Space, they tend to be a kluge of different authors, as with Peter L. Hays' *Space Power for a New Millennium*, or they are an editorial on the integration of the different Space sectors—civil, military, intelligence, and commercial, such as the numerous publications by Joan Johnson-Freese.

Lambakis' book is different. The subject matter never departs from military Space, and the author includes technical descriptions with an intellectual and engaging writing style. There are three parts to the book: a perspective on the importance of military Space, a logically based distillation of the Space threat, and the developing story of military Space policy.

However, skip the introduction and first chapter! The Carl Saganish mother and apple pie can be tough on the serious reader's stomach, the section subtitles are "cutesy" instead of useful, and the historical overview is so sparse and incomplete that the Pulitzer Prize-winning McDougall (author of *The Heavens and Earth*) would win another prize by documenting corrections to the text. Furthermore, facts in the first chapter actually conflict with the information in the rest of the book. Lastly, the technical descriptions of satellite technologies are incomplete and difficult to understand. My impression is that an editorial board or book publisher took authorship away from Lambakis and had free reign designing the introduction and first chapter. Skip to chapter 2; the author's true style and the well-documented text begin at this point.

As a new FA 40, does your boss, your friends, or your family ask, "Why are you a Space Operations officer?" Have them read chapters 2 and 3. Like Lee Greenwood's song, "Proud to be an American," these chapters will have your family telling everyone that they are proud to know an American Space officer. Really, Lambakis' explanations of the importance of Space on the global front and the implications of Space on military strategy put into writing what most of us FA 40s talk about with buddies during backyard BBQs. The intellectual component of the two chapters is captured through the author's use of writings by Kant and Joffe as a baseline, and then the author moves into the implications of the Space revolution to warfare and defense policy.

Unfortunately, the author relies heavily on Air Force sources. The Air Force tends to reflect on the future use of Space or the future of military Space technologies. As a result, many examples tend to be future-oriented instead of being focused on the current Space Force Enhancement activities. As the Army is the number one consumer of Space products, I would have preferred that the author dedicate a chapter to how satellite capabilities are currently translated to the warfighter. I cannot complain too much, however, for to date, there have been no major publications oriented on Space Force Enhancement from an Army perspective.

Part 2 of the book is an excellent military space primer for the novice to intermediate Space Operations officer. With access to open-source material only, the author manages to put together a relatively sufficient picture of our operational and R&D capabilities. His description of individual satellite technologies is good enough to make you an expert among your operationally branched peers. However, I would recommend that the military reader to crosscheck the book against information on the SIPERNET before turning it into informational briefing slides of open-source information that you do not want to confirm or deny as truthful.

Further into Part 2, the author puts together the first coherent evaluation of the Space threat that I have seen outside of the Space Warfare Center's Space Aggressor team. His description of our current Space adversaries'/competitors' capabilities and their Space Control capabilities held my attention. His line of reasoning may be perceived as hawkish, but the author's logic is well orga-

nized to the point that even a former DAT could understand. Also, while you may not agree with the author on the state of the Space threat, he will have been successful if you can use his logic as a baseline for your own intellectual meanderings on Space militarization.

The author is certainly a hawk. He sees Space warfare coming but portrays the threat as currently innocuous yet imminent. Further to his credit, his position is obviously counter to the NASA and COUPA-oriented "Space is for peace" purist position. He depicts many of the current Space policy wonks as naïve intellectuals with too much funny smoke coming out of their peace pipes to see the writing on the wall.

This brings us to Part 3 of the book. Stop at Part 2 and put the book away if you are happily operationally oriented in Colorado Springs or at one of the coveted Corps positions. If, however, you are remotely considering taking an assignment in DC, then Part 3 is a must read. Lambakis' descriptions of our defense policy development are incredibly detailed and very engaging. His overview of the key players, Senator Robert Smith (NH), Senator Trent Lott (MS), Congressman Dick Gephardt (MO), Senator Tom Harkin (IA), Senator Strom Thurmond (SC), and others, is the best I have read (though I understand Everett Dolman has a book coming out this summer that may be as good or better). I called MAJ Lem Williams in Crystal City to confirm some of the political facts, and it all checked out! Furthermore, the author's chronology of the various political military Space footballs—KE ASAT, Space-Based Laser, MIRACL, etc.—made me "feel the pain" of the FA 40s recently assigned to the Pentagon and Crystal City. Like the U.S. buying all of the SPOT imagery during DESERT SHIELD, MAJ John McDaniels, our assignments officer, is sure to be buying all available copies of the book as a defensive measure. Hats off to our FA 40s slugging it out in DC; Lambakis paints you as saints.

In conclusion, I do recommend that each reader review every Space author's list of references before engaging in a book. After reviewing the list of references used in Lambakis' book, my mind was set with some skepticism. His reference list is a who's who of Air Force generals heading up Space-related agencies. Unfortunately, the author's "facts" in the first chapter indicate that he may not have crosschecked comments by Air Force agency heads with other sources. Statements like NIMA is streamlined to provide tailored products rapidly to the warfighter and that the DSCS communications system is organized and run by the Air Force led me to believe that the author was taking some of the comments by his sources at face value.

However, when the reader gets to chapter 2, he/she is in for a quality book on military Space. Should this be the one book on the FA 40's shelf? Absolutely not. However, every FA 40 can validate his/her technical and operational knowledge against Part 2, while every FA 40 action officer in the Beltway can commiserate with the unique descriptions of military Space project and policy meanderings in Part 3.

Aerial Reconnaissance –

(Continued from Page 12)

2 Palmer, R. R., "Frederick the Great, Guibert, Bulow: From Dynastic to National War," in *Makers of Modern Strategy*, edited by Peter Paret (Princeton University Press: Princeton, 1986): 100.

3 Von Clausewitz, Carl, *On War (1832)*, edited and translated by Michael Howard and Peter Paret (Princeton University Press: Princeton, 1976): 302.

4 Burne, Alfred H., *The Crecy War* (Eyre & Spottiswood: London, 1955), cited in *The Eye in the Air*: 7.

5 Chandler, Charles deForest *How Our Army Grew Wings* (Ronald Press Company: New York, 1943): 4.

6 Chandler, 4.

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10 Mead, 14.

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14 Chandler, 23.

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18 Chandler, 35.

19 Chandler, 37.

20 Chandler, 36.

21 Chandler, 38.

MAJ John J. McDaniel

Major John J. McDaniel is the FA 40 Assignments Officer/ Career Manager.

Career Manager Talks about the Assignments Process

by MAJ John J. McDaniel

This article is a compilation of ideas, thoughts, and observations that I have formed over the past year while serving at the U.S. Army Personnel Command (PERSCOM) as the FA 40 career manager and assignment officer. This column is dedicated to providing useful information about your career, this FA 40, and present and future opportunities.

First, I would like to extend my sincere thanks to all the officers I have assigned and worked with over this past year. To an officer, you have each been extremely professional, courteous, and a pleasure to work with. Your sense of commitment and selfless service has been inspiring.

The Assignment Process

I field many questions about how the assignment process works. Figure 1 helps define the process.

The key to understanding this complicated process is to understand that timing plays a critical role in any assignment action. I am 100% dedicated to the notion of placing the "right officer" in the "right job," at the "right time," and for the "right reason."

By now, most of you have probably had the opportunity to see my road show briefing. If not, I will email you a soft copy upon request. Recently, I decided to determine FA 40 employment statistics, i.e., how many FA 40 officers are currently working in Space jobs. That may seem like a strange way to think about the FA 40 community, but given that OPMS XXI has yet to achieve a steady-state condition, I thought it would be interesting to see what I would discover. Steady state will be achieved once the Army has completed the Career Field Designation (CFD) process for the older year groups (groups 1984 and 1985). These two year groups will CFD this fall (Sep–Oct 01). Additionally, all remaining majors who have not previously been offered the opportunity to CFD will be able to choose their career fields this fall. Future year groups will be career field designated in conjunction with major's promotion boards.

There are officers in our inventory that are not working in Space-related assignments. There are a number of reasons for this, but nonetheless, it is a small percentage of the total population. This situation will work itself out over time and we will soon reach a condition of full employment.

Figure 2 depicts the current employment statistics for the FA 40 community. The Training, Transient, Hospital, and Schools (TTHS) account is a natural occurrence and routinely accounts for approximately 6 to 7% of our Army. The FA 40 figure of 10% is slightly higher than the DA average; this, in part, is due to the Space Qualification Course that will be held this summer.

Joint Assignments

Many officers inquire about Joint assignments. Joint assignments are, generally speaking, nominative positions, which means that the officer's file must be passed through a series of approvals prior to being accepted

How It Works

- Fair doesn't always mean equal, and equal isn't always fair.
- Right officer, right job, right time, right reason—not just lip service
- Key ingredients:
  - Skills: Officer qualifications/attributes
  - Timing: TOS, ODP, job availability, needs of the Army
  - Preferences: Officer desires and unique circumstances
  - Wild Cards: Uncertain nature of operations, BNRs, senior leader involvement

Figure 1. The Assignment Process

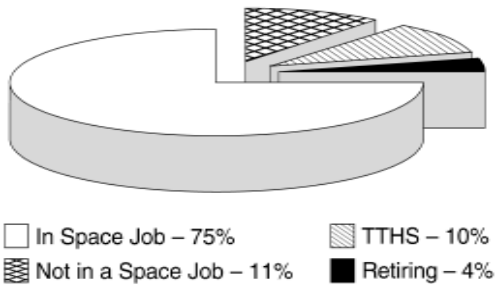

Figure 2. Steady State and Population Statistics

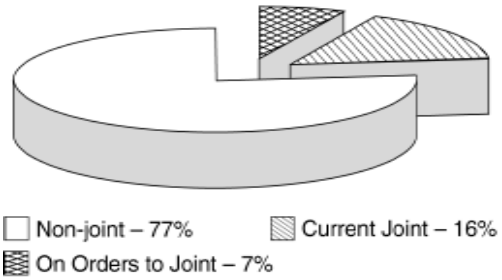

Figure 3. Career Paths and the Snowman Model

and the officer being placed on orders. Figure 3 above graphically depicts the percentages of Joint verses non-Joint assignments. Keep in mind that these statistics are in a continual state of flux.

I have been tasked to help develop career path models for our officer corps. That effort is a work in progress. When we begin to consider officer career paths, we must be careful not to slip into the mindset of traditional or operational model paradigms.

Figure 4 is a useful model for considering the levels of war and how to grow and cultivate experience within the FA 40 community. Ideally, we would like to expose all officers to each level throughout the balance of their career, so at endstate, we have a well-rounded and experienced officer corps capable of rising to any challenge, in any situation. Conceptually and preferably, officers gain their tactical experience during their tenure as junior officers in tactical and field units. From there, officers are placed in various units at various operational levels throughout the Army and Joint community in order to meet Army and DoD requirements.

A critical component to field grade assignments is the completion of Military Educational Level 4 (MEL4) education. Command and Staff College (CSC) is now a two-year look system. If not selected after your first look, officers are strongly encouraged to enroll in the non-resident, correspondence course. Completing MEL4 opens the door to many additional assignment opportunities within the FA 40 career field. Figure 4 is conceptual in nature and should be used as a guide for an officer's career path and progression.

People and Places

Congratulations to the following officers who were recently selected and/or slated for attendance at Command and General Staff College:

- Major Dennis Brozek (attending AY01/02)
- Major Steven Choi (deferring)
- Major Daniel Cockerham (attending AY01/02)
- Major Lee Gizzi (attending AY01/02)
- Major Michael McFarland (attending AY01/02)
- Major Troy McKeown (attending AY01/02)
- Major James Patterson (deferring)
- Major Andrew Weate (attending AY01/02)
- Major Saundra Yanna (attending AY01/02).

Congratulations to the following Studies in Advanced Military Science (SAMS) students:

- Major Tom James: SAAS, Maxwell AFB (graduated June 01)
- Major Gordon Quick: SAMS, Ft. Leavenworth, Kans. (select).

Congratulations to the following officers who were recently selected for Advanced Civil Schooling:

- Captain Sam Amber
- Captain Michael Draper
- Captain Brian Moore
- Captain Andrew Hinter.

Congratulations to the following officers who were selected for attendance at the first FA 40 Qualification Course in Colorado

Figure 4. Spanning the Operational Continuum

Note: *This is a conceptual model; your opinions and suggestions are welcomed and encouraged.*

Springs. The following officers are attending the course on TDY en route to their new duty stations:

- Major George A. Andry
- Lieutenant Colonel Robert H. Bruce
- Major Dennis L. Campbell
- Major Steven B. Choi
- Major Duncan Currier
- Major Robert P. Fabrizzo
- Major Robert Guerriero
- Major Thomas L. James
- Major Robert E. Klingseisen
- Major Patrick Marshall
- Major James D. Pruneski
- Major Sean Scally

Congratulations and encouragement to the following officers who continue to pursue advanced degrees in Space Operations at the Naval Post-Graduate School:

- Major Darius White
- Captain Michael York

Congratulations to the following officers who were recently selected and/or slated for attendance at the Senior Service College:

- Lieutenant Colonel Wayne Brainerd (deferring)
- Lieutenant Colonel Timothy Coffin (deferring)
- Lieutenant Colonel Edward Sekerak (deferring)

Thank you for your time, energy, and service. For additional information, please visit my website at http://www-perscom.army.mil/opfamio/fa40.htm or contact me via e-mail at john.mcdaniel@hoffman.army.mil.

Your feedback and comments are of great interest to me. If you have any thoughts on future topics or areas of concern or interest, I would appreciate your input. I will do my best in addressing those areas in future publications.

Seize the Ultimate High Ground!

IPB –

(Continued from Page 19)

to depict how Space control efforts could be coordinated. The situation template could include identification of possible high-value target satellites, LOS to the target, and how negation efforts will assist in friendly force mission accomplishment.

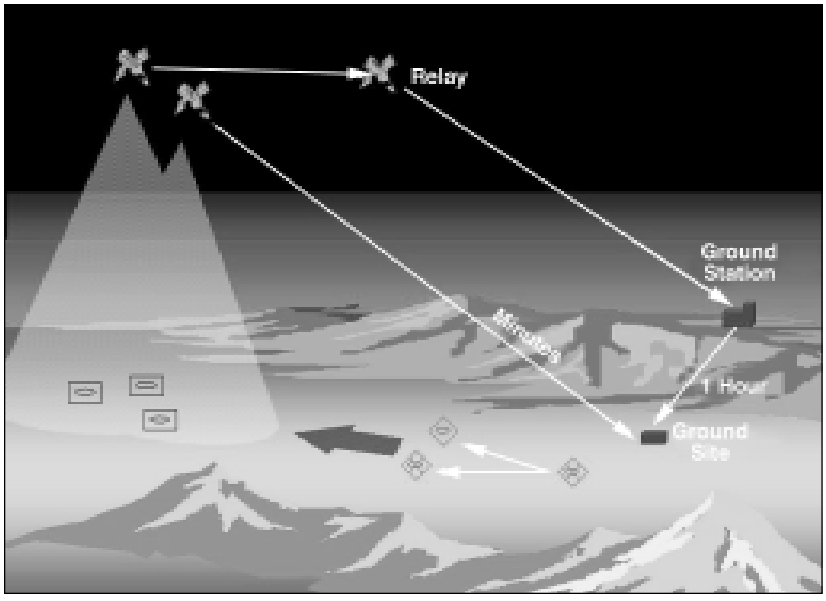

Figure 4. Threat Satellite Intelligence Situation

These four steps are the baseline for Space IPB analyses. They can be abbreviated (METT-T) or expanded to include development of other Space IPB tools, such as the decision support template, and/or included in the staff synchronization matrix. The bottom line is that Space IPB is a process that can help the FA 40 provide significant input to staff planning and assist supported unit mission execution.

Summary

To help automate the Space IPB effort, the ARSPACE G2 shop is working on a Space IPB software tool. This tool will bring motion to Space IPB products, such as the situation template, and thus show satellite orbit data more clearly. The goal is to have an IOC capability for this tool by the UFL timeframe. This effort is designed to complement the work of the Space and Missile Defense Battle Lab (SMBL), AF Space, and the National community on such efforts as Space Battle Management Core System, the Battlefield Visualization Initiative (National Reconnaissance Office battlefield visualization), and the FDIC's efforts in Space doctrine. A practical, common sense Space IPB doctrine, combined with the right tool set, should greatly assist the FA 40 and Army Space Support Team in providing optimal/understandable Space support to the tactical commander.

Writing Guidelines for The Journal

by Mr. Jonathan W. Pierce

Authors must follow these guidelines in preparing articles and accompanying artwork for publication in *The Journal of Army Space Operations*.

Preparing the Manuscript

Identification of the author and keeping pages together is an essential step in manuscript preparation. The top left corner (do not use headers or footers) of the first manuscript page must include:

- A short label title
- Author's full name and title
- Telephone no. and e-mail address
- Total page count
- Total word count

The top left corner of subsequent pages must include (again, do not use headers or footers): the short label title, author's last name, and the manuscript page number.

Articles should be prepared in Microsoft Word. The document filename must be descriptive instead of nonsensical. (For an article on satellite communications written by someone named Jones, "SATCOM Jones" is much better than "1uplink0301".)

Articles must be prepared in 8.5-by-11 inch letter format, double-spaced. E-mail articles to: fallenld@smdc.army.mil.

The average length of most Journal articles should be approximately 1,500 words, roughly six manuscript pages.

Endnotes are the accepted form for identfying sources in the Journal; endnotes have the advantage of gathering all notes at the end of the article, thus avoiding any disruptions to the flow of content.

Artwork includes any of the following: photographs, presentation slides, charts, graphs, tables, or line art. Remember, the Journal is a black and white publication, but it is likely to be displayed on the Internet. Graphics should be submitted in both black and white and color versions.

Artwork should be sent in jpeg or tif formats, at 300 dpi, high resolution. Powerpoint slides do not reproduce well in printed publications.

Artwork ***must not*** be embedded in your digital computer text file. Instead, simply insert a notation in the text of where artwork supports text. Each piece of artwork must be sent as a separate file.

If hardcopy photographs are submitted, do not write on the back of photographs. Type cutlines and other information on bond paper and tape them to the back of the photographs. If sending digital photographs and cutlines, both should have descriptive filenames as mentioned above. However, each photograph and its cutline should have associated filenames, i.e., a photograph filenamed "satellite 1" should have a cutline filenamed "cutline satellite 1."

Submissions may be sent to the U.S. Army Space and Missile Defense Command, Force Development and Integration Center, ATTN: LTC Larry Fallen, P.O. Box 15280, Arlington, VA, 22215-0280.

Sources of Style and Grammar Usage

There are many style and grammar usage textbooks, styleguides, and reference works. The Journal uses the following sources to standardize its style, grammar, and spelling:

- *The Chicago Manual of Style*, 14th Edition, as its primary standard
- *The American Heritage College Dictionary*, 3rd Edition
- Military rank abbreviations as defined by the service departments

Communicating the Message

Authors should strive for clarity. Simple, direct words communicate best. Because the intent of the Journal is to increase knowledge through discussion and debate, authors should write to communicate, not to impress.

A good example of clarity lies in the choice between "use, uses, using" and "utilize, utilizes, utilizing." Use, and its variants, is much more simple and direct than the alternatives.

All acronyms and abbreviations must be defined in full.

Don't back into your thoughts. Using the active case is usually (not always) best. Long sentences are hard to read. Long gray blocks of type seem boring to most readers.

Vary sentence lengths from 15 to 30 words. Limit paragraphs to one topic but don't hesitate to break an overly long paragraph in two. A mixture of short, medium, and long paragraphs can aid the psychological appeal of the article. Break up long text blocks with meaningful subheads, pull quotes, tables, and graphics. JASO

Mr. Pierce is the Managing Editor of *The Journal of Army Space Operations*. Assigned to the SMDC Public Affairs Office, Mr. Pierce is also the editor of the Command's newspaper, *The Eagle*, and the SMDC Command Information Officer. Prior to coming to SMDC, Mr. Pierce worked for six years as a book editor at National Defense University Press in Washington, DC. He holds a bachelor's of science degree from the University of Maryland and has more than 27 years of publishing experience in military and civilian newspapers and magazines, as well as book publishing.

U.S. Army Space and Missile Defense Command
Director, Force Development and Integration Center (FDIC)
ATTN: SMDC-IC
P.O. Box 15280
Arlington, VA, 22215-0280

First FA 40 Course Graduates

The Army reached a milestone on the afternoon of August 3 as 14 officers successfully completed the Army's first Space Operations Officer Qualification Course.

"There is only a small cadre of Space Operational officers," said guest speaker LTG Joseph M. Cosumano, Jr., commanding general of the U.S. Army Space and Missile Defense Command and U.S. Army Space Command, before a group of 75 military and civilian personnel during the graduation ceremony in the U.S. Air Force Space Command Headquarters on Peterson Air Force Base.

"You are breaking new ground," he said. "It is like any trailblazer. There are really no markers for you. But you have to go somewhere and there is a destination. It is an uncharted path. You will go down that path and mark the trail for those who will follow. It's really left to you to create your destiny, and your role in Space in service of the U.S. Army and its warfighting commanders in chief.

"All the products of space—navigation, communication, warning and intelligence—will be key to the U.S. Army Objective Force, which will be a much lighter and more lethal force. For it to accomplish this mission, it must be able to see first, understand first, decide first, and then finish decisively. And Space will enable that force to do that.

"As we look at the 21st century, Space-based communications will enable soldiers anywhere in the world to enter and gather information from the global information grid. The fact is that the Objective Force must be and will be a Space-based enabled force.

"You will be spread thin across the Army and the Office of the Secretary of Defense, various defense agencies, and among our warfighting CINCs. They will come to you and ask, where are the Army Space requirements, and they will expect you to know.

The graduates are: LTC Robert H. Bruce, assigned to SMDC; MAJ Richard E. Brence, 193rd Space Support Battalion, Colorado Army National Guard; MAJ Dennis L. Campbell, U.S. Space Command; MAJ Steven B. Choi, III Corps; MAJ Duncan C. Currier, National Reconnaissance Office; MAJ Robert R. Fabrizzio II, NRO; MAJ Robert A. Guerriero, Jr., NRO; MAJ Thomas L. James, III Corps; MAJ Robert

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